

THE IRON AGE

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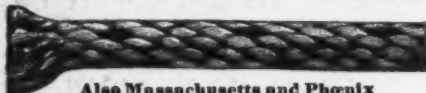
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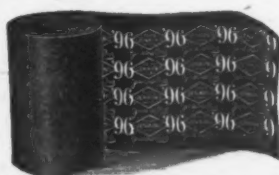
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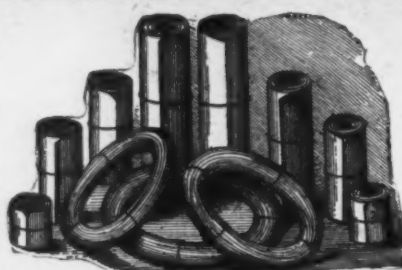
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THE IRON AGE

THURSDAY, JUNE 20, 1901.

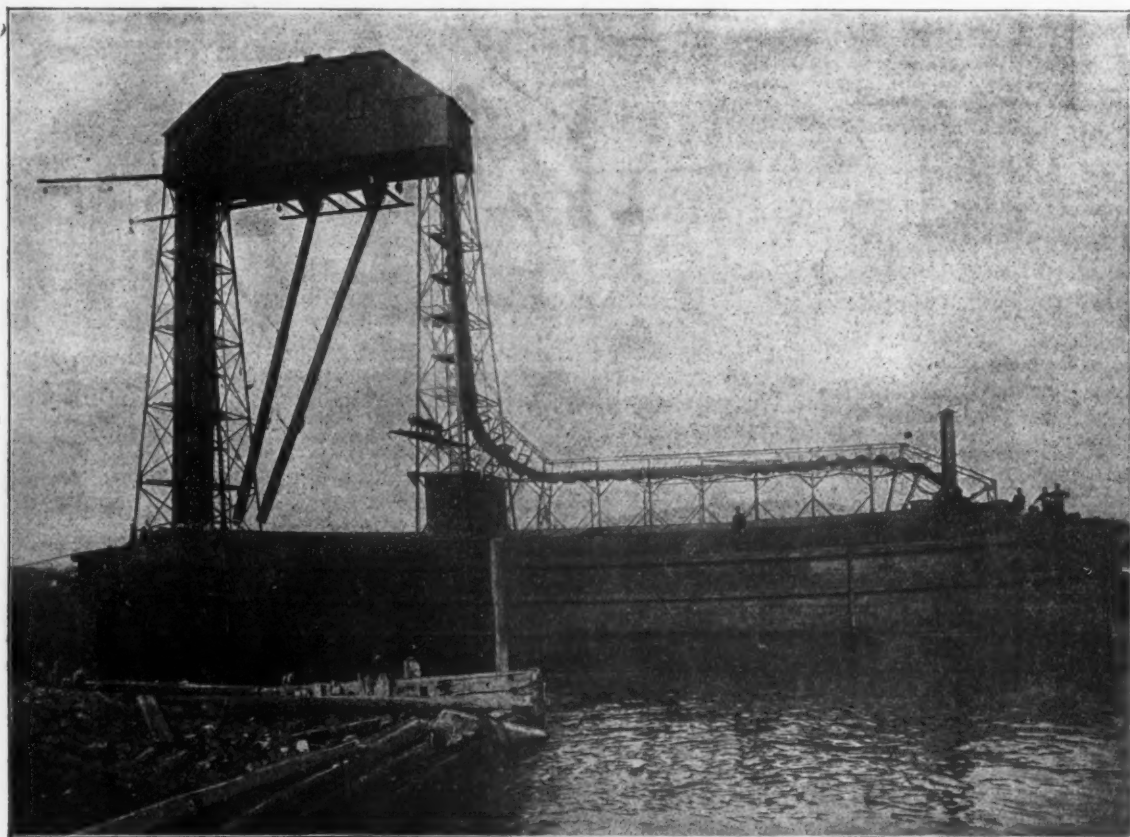
The Clarke Automatic Coaling and Weighing Barge.

The Old Method.

From the time when a large Atlantic Ocean steamer arrives in port until she leaves again she is an unproductive piece of property. She has cost a million dollars or more to build, and her officers and crew are constantly under pay, but she earns no money while lying idle in port. In order that a vessel shall earn the greatest annual profit for her owners she must make the greatest possible number of voyages in a year—that is, she must run at full speed while at sea and stay in port the smallest possible number of days in the year.

at the coal docks, such as the delay due to one vessel waiting for another when several vessels are needing coal at the same time and place, and the idle time of workmen, due to irregular arrival of vessels. It is therefore necessary for each vessel to receive coal at its own dock from barges lying alongside, during the time cargo is being discharged or loaded.

By the ordinary barge system of coaling steamers there is a fleet of barges in the harbor, which are filled, one after the other, at the coal docks, and are towed to the vessel requiring to be coaled. With a sufficient number of barges in the fleet there will always be enough of them filled with coal and available at a moment's notice to be towed to any vessel where they may be wanted, and, usually in a busy harbor like that of New



THE CLARKE AUTOMATIC COALING AND WEIGHING BARGE.

There is a vast amount of work to be done on a vessel every time she comes to port, and it all must be done in a hurry, for she must leave at a given hour to get high tide while crossing the bar. The ship must be cleaned throughout, the machinery put in complete repair, the cargo discharged and a new cargo put aboard. Food and supplies of all kinds must be obtained and stowed away.

The most troublesome, disagreeable and time consuming operation which is done on a ship while in port is that of receiving and stowing her bunker coal. A large transatlantic steamer requires from 2000 to 3000 tons for each voyage. Her time is too valuable to permit of her going to the coal docks and receiving it through inclined chutes directly from the coal bins, for, owing to the small openings leading to the bunkers, it cannot be taken on board any faster than it can be stowed away and trimmed in the bunkers, an operation requiring many hours. There are other objections to taking coal

York, enough empty ones to be filled at the coal docks, so as to keep the force at these docks employed regularly.

The coal barge being moored alongside of the ocean steamer, the problem then in hand is to transfer, say, 1000 tons of coal from the former to the latter and to trim it in the bunkers in the shortest time possible, with the least cost for labor and with the least annoyance from flying dust. By the usual method the coal is shoveled by hand into bags, baskets or iron buckets on the barge, and these are lifted by a "whip," operated by a steam winch on the steamer, lowered and dumped into the bunker opening, which may be either in the deck or in the side of the vessel. From the bunker opening the coal, after dumping, slides down a chute or trunk into the bunker, where it is stowed into place by the trimmers. Of all kinds of work now done by human labor that of trimming coal in the unventilated bunkers of some ocean steamers is probably the most exhausting

The New Method.

We illustrate herewith a new method of coaling steamships which has been in successful operation for the past year in New York Harbor by the Automatic Coaling & Weighing Barge Company, 29 Broadway, New York City. By the new method the coal is contained in a steel barge of 1000 gross tons capacity, divided by transverse bulkheads into several compartments or coal bins. The floor of each bin is raised above the bottom of the barge, to accommodate a passageway which runs the whole length of the bins, just above the keel, and in which a train of buckets is drawn by an endless chain composed of flat steel links. There are three square openings in the bottom of each bin, closed by sliding doors, and as each hole is opened the coal lying above it slides down into the buckets. The train of buckets is moved by means of a steam engine in the rear compartment of the

The rear compartment contains the boiler, engine, hydraulic pump, gearing and other appurtenances of a complete power plant. The forward compartment contains the quarters for the crew. The other compartments are all devoted to coal bins. Each bin is 16 feet long (in the direction of the length of the barge) and 28 feet wide at its greatest horizontal section, and each discharges its coal into three openings 22 inches long by 24 inches wide at its bottom.

Fig. 4 shows a transverse vertical section of the barge, taken through one of the coal bins, and this view shows several of the most important elements of the barge's mechanism. First of these is the elevating floor, which is shown in its lowest position at the right hand of Fig. 4 and in its highest position to the left. Each of the movable floor sections is hinged at its lower edge, and at the outer edge almost touches the inner surface of the sides

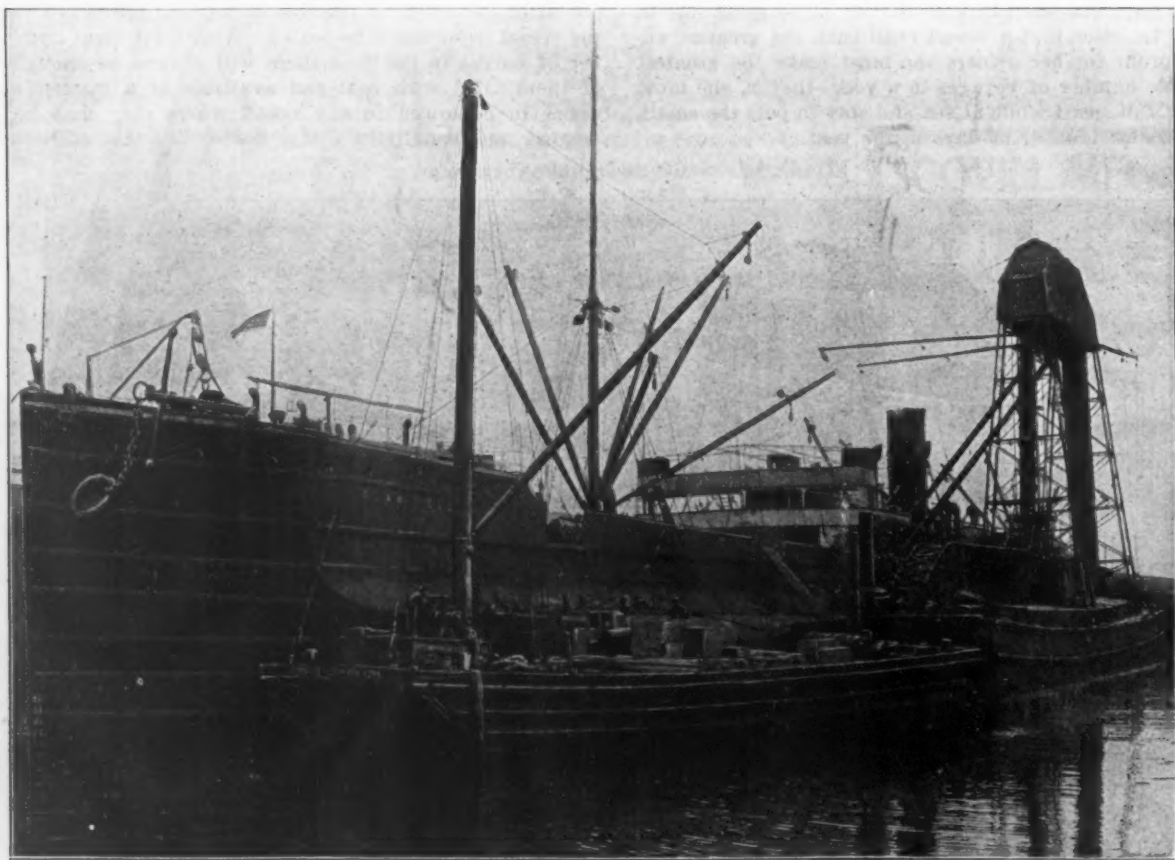


Fig. 2.—Coaling a Vessel.

THE CLARKE AUTOMATIC COALING AND WEIGHING BARGE.

barge, through the horizontal passageway, then vertically upward in a tower which contains two automatic weighing and recording scales, into one of which each alternate bucket is dumped. The coal then slides from the scales into two telescopic steel tubes, which deliver it into the bunkers of the steamer. The principle of the coaling barge is therefore similar to that of the well-known floating grain elevator, but the machinery is much heavier and contains many devices to facilitate the handling of a somewhat intractable material like coal.

The barge delivers the coal steadily at the rate of 125 gross tons per hour, and has been operated for several hours at a time at a rate of 135 tons. The whole operation is almost noiseless and free from dust, and it is accomplished entirely by the machinery of the barge, without any hand labor and without the assistance of any of the machinery or crew of the steamer.

Description of Barge.

Referring to the illustrations, Fig. 3 is a longitudinal vertical section and plan of the barge. Its dimensions are: Length, 144 feet; beam, 30 feet; depth, 18 feet from deck to keel; draft, loaded, 14 feet.

of the bin, which are formed in a curve, as is clearly shown in the drawing.

Hydraulic Lifts Under Bin Floors.

Each of these movable sections of the floor is 16 feet long and 11 feet wide, is strongly built and therefore heavy, and supports a considerable load of coal. The lifting of each one is accomplished by means of two hydraulic lifting rams, each with a plunger 6 inches in diameter and 42 inches in stroke, which oscillate on trunnions. There being two lifting jacks to each movable section of the floor, it is essential that each one of the pair moves in harmony with the other, so that neither one can get in advance of the other, although the loads upon the two may be very unequal. This is accomplished by means of an automatic two-way hydraulic valve, which governs the admission of water to both of the cylinders. As long as the outer edge of the moving floor section which is being lifted remains horizontal the valve is in midposition, delivering water equally to each of the two cylinders; but the instant that one end of the outer edge becomes tilted upward the valve is moved so as to check or stop the water flowing into the

cylinder nearest that end until the horizontal position of the outer edge is restored. This ingenious application of a single valve to control two or more hydraulic lifts connected to a single moving platform is adaptable to many other purposes besides the one for which it is used in this barge. It is the invention of Mr. Clarke and is fully protected by patents.

Fig. 5 is a photographic view of a row of the hydraulic lifts under the moving floors of several of the bins. All of the lifts are supplied with water under pressure from a hydraulic pump and accumulator located in the compartment at the rear of the barge. The valves controlling each pair of lifts are located near them, but the handles by which they are operated are located at a convenient position above them on the upper deck, a long rod connecting each valve with its handle.

easily started sliding again if it is touched with a bar or pick. This is the office of the rotating picker. It is driven by chain gearing from a shaft which is carried from the coal bins back to the engine room, and is, at will, connected or disconnected from the shaft by a clutch operated from the deck.

The Conveyor.

Leaving now the coal bins we come to the passageway underneath them, which contains a railroad track and a continuous train of buckets, called gravity buckets, which are pivoted and swung from steel links on both sides. The links are carried on wheels which run on the rails. The buckets are shown in Fig. 7. The lip of each overlaps the edge of its neighbor, so that no coal can drop between the buckets. As the buckets become

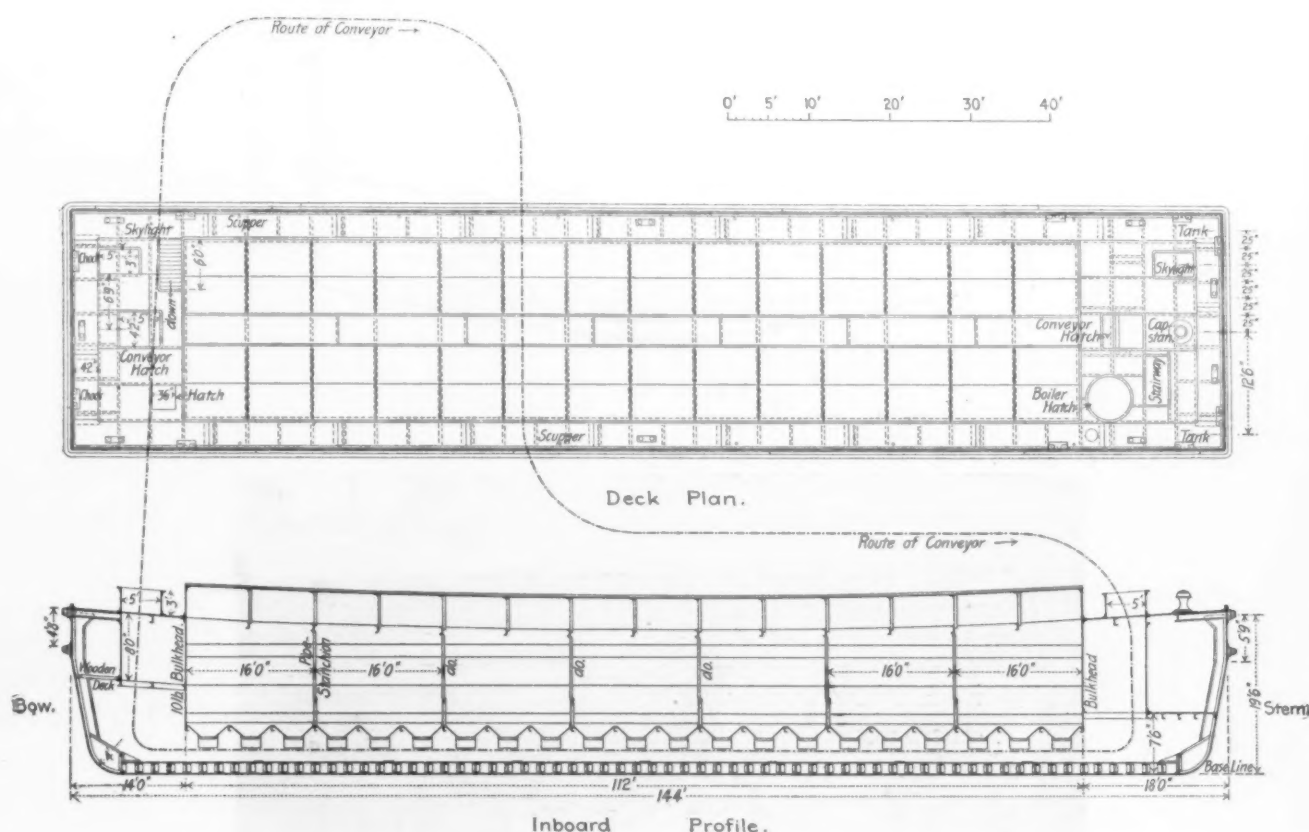


Fig. 3.—Plan and Longitudinal Vertical Section.

THE CLARKE AUTOMATIC COALING AND WEIGHING BARGE.

The Bin Gates.

The next features connected with the coal bin to be considered are the gates or doors which close the two rectangular openings in the bottom of each bin, and the method of operating them. They are simply flat cast iron plates supported and operated on specially designed bearings by which the usual clogging of coal is eliminated. They are opened and shut by a system of bell crank levers, clearly shown in Fig. 6, which are operated through easily detachable jaw clutches, by means of a shaft which runs the whole length of the coal bins, back to the stern compartment, where it is actuated by a steam cylinder. Handles located above each coal bin on the upper deck control the clutches belonging to the levers of each of the gates, and also the valves of the cylinder, to rotate the shaft and open or shut at will any one of the gates when its clutch has been thrown into action.

Still another mechanical feature connected with the coal bin is a rotating picker bar, placed just above the gate at the bottom of the bin. The coal in sliding down to the openings in the bottom of the bin often becomes blocked by wedging or scaffolding itself across the inclined surfaces of the lower part of the bin, but it is

loaded by passing under an opening in the bottom of one of the coal bins, they then pass under the edge of this opening, where the trimming above referred to takes off the surplus load and lets the buckets pass one after the other each with a uniform level load.

The buckets while pivoted in the links are kept in a horizontal position by an arrangement of guide rails. The train of buckets is moved along by means of the links to a point in the forward compartment, where its direction is changed to the vertical by the links passing 90 degrees around a wheel, and its motion then continues upward, guided by vertical tracks supported on the frame work of a tower to the top of the latter, where the tracks bend to the horizontal, Fig. 8. The buckets then travel horizontally a short distance, when the coal in each alternate bucket is dumped into a hopper leading to a weighing scale located just below. The second bucket of each pair is dumped when it reaches the hopper of a second scale, a little further along. The empty buckets then descend in a second tower to a point a few feet above the deck, then travel to a point above the stern compartment, into which they descend to the level of the passageway. In this compartment the links which carry

the buckets, forming an endless chain, engage with a heavy sprocket wheel, which is driven by gearing from the engine.

Power Required.

The work done by the engine when the barge is delivering coal at the rate of 125 gross tons per hour is that of elevating this coal from the level of the track in the bottom to the level of the track above the scales, a distance of 75 feet, or $125 \times 2240 \times 75 = 21,000,000$ foot

The steam engine is an ordinary slide valve engine with cylinder 8 inches in diameter and 10 inches stroke. Its speed when moving 125 tons of coal per hour averages 200 revolutions per minute, but it has been run as high as 250 revolutions. With boiler pressure at 60 pounds and 200 revolutions per minute, cutting off at three-quarter stroke it will develop about 13 horse-power. The boiler is a vertical tubular, 58 inches diameter with 5-foot 6-inch tubes and is rated at 50 horse-power.

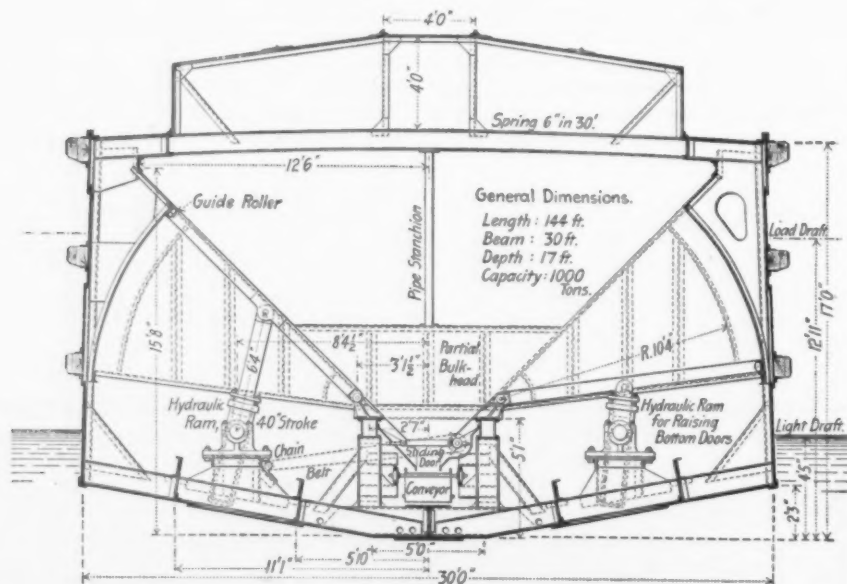


Fig. 4.—Transverse Section through One of the Coal Bins.

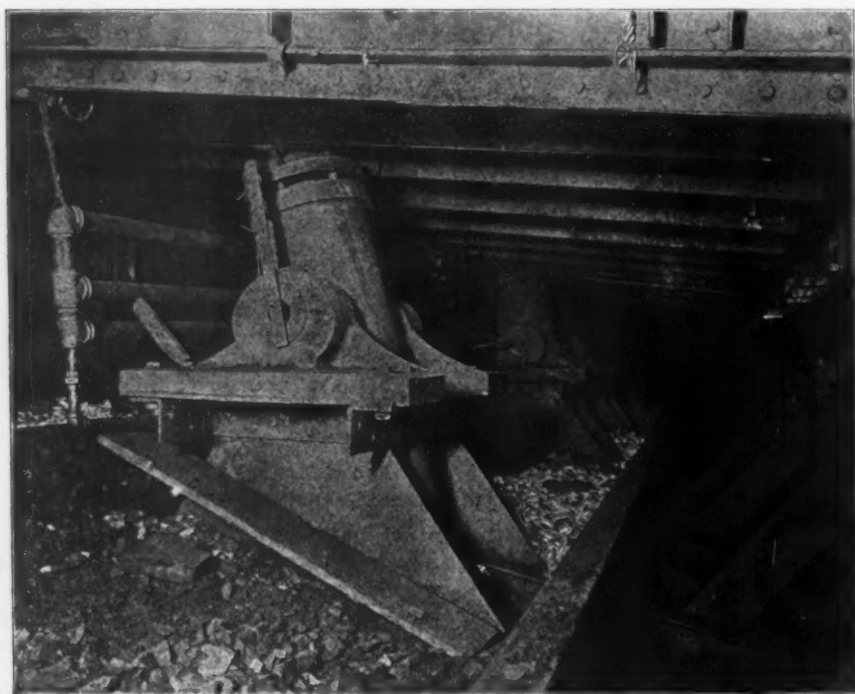


Fig. 5.—Hydraulic Lifts Under the Floor.

THE CLARKE AUTOMATIC COALING AND WEIGHING BARGE.

pounds, which is equivalent to 10.6 horse-power, besides the overcoming of the frictional resistance of the moving buckets, links and gearing, which is about 1 horse-power. A trifling amount of power of the engine is also used in operating the horizontal shaft which actuates the rotating pickers in the bins. The boiler furnishes steam for the engine, for the hydraulic pump which supplies water under pressure to the hydraulic cylinder used for moving the gate valves under the coal bins, and to the hydraulic cylinder under the movable floor sections.

Automatic Scale.

The automatic scale is a remarkably efficient piece of mechanism. It consists of a rotating cylinder divided by sheet steel partitions into four quadrantal sections or compartments, each capable of holding $\frac{1}{4}$ ton or 560 pounds of coal. In its normal position for receiving coal the partitions stand at an angle of 45 degrees with the vertical, so that the opening of one of the compartments is directly upward. The whole weight of the cylinder, together with the coal that may be in one compartment, is carried on two journals, the boxes of which are mova-

ble vertically a distance of 3 inches between guides, the bearing of the boxes on the vertical guides being a set of four wheels, to diminish friction. The weight of each of these boxes is supported by well made and nearly frictionless chain, carried over two ball bearing pulleys to a heavy counterweight, as shown in the cut. These ball bearing pulleys take the place of the knife edge pivots of ordinary scales. They are inclosed in dust proof casings.

The angle of the hopper delivering coal to the scale is such that the coal slides down it at a moderate rate and the edge of the hopper is so close to the scale that when the compartment of the scale is full the coal is blocked

The barge being supplied with two scales, and running at the rate of 125 gross tons per hour, each scale will be dumped 250 times in an hour, or a little over four times per minute, thus allowing ample time for filling without shock. The accuracy of the scale is quite remarkable. Repeated tests under the most rapid conditions of working have shown that its mean error does not exceed a quarter of 1 per cent. Its durability has also been thoroughly tested; the two scales on the barge, after a year's use, are apparently as good as new, and have thus far required no repairs.

This automatic weighing and registering of the amount of coal delivered by the barge is a matter of con-

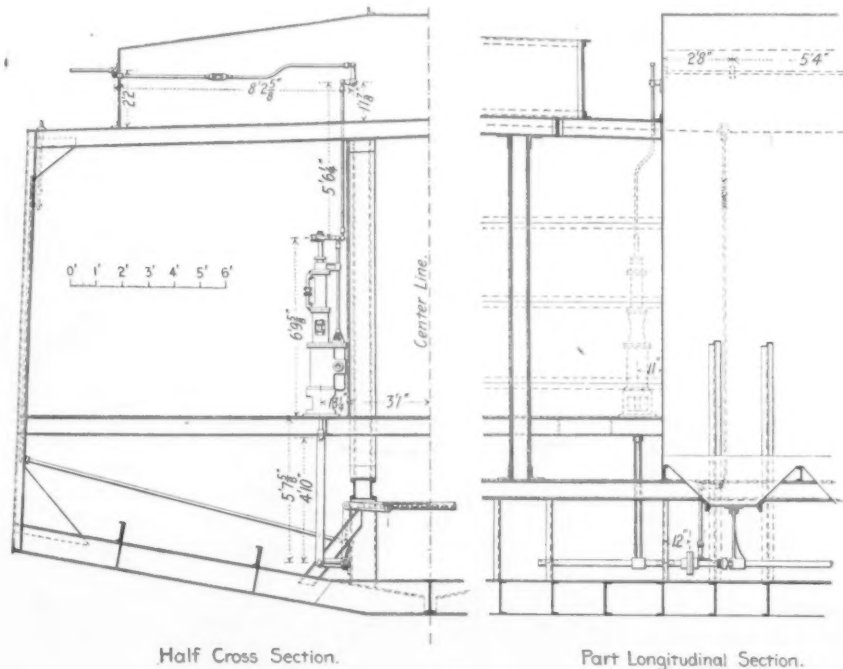


Fig. 6.—Operating Mechanism of Bin Gates.

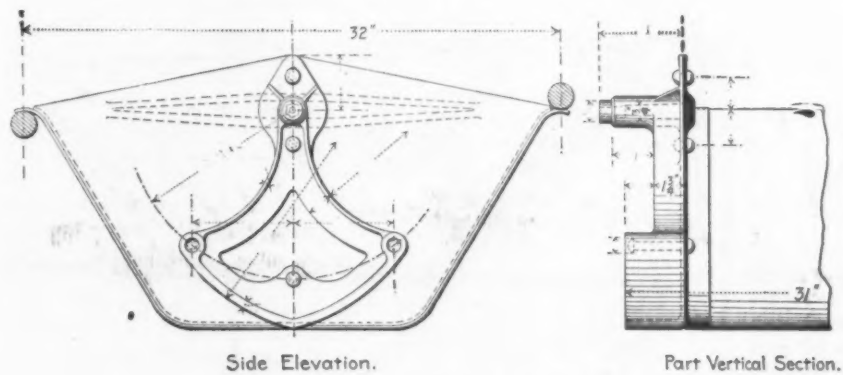


Fig. 7.—Gravity Bucket.

THE CLARKE AUTOMATIC COALING AND WEIGHING BARGE.

in the hopper, and there is no coal falling through the air. The instant that there are 500 pounds of coal in the scale the counterweight is overbalanced, and the scale begins to descend, a knife actuated by a heavy weight suddenly cuts off the descending stream of coal, a latch is thrown open, the scale rotates through an angle of 90 degrees and dumps its coal into the hopper below, whence it slides through the telescopic tubes to the coal bunker in the steamer. The coal having fallen out of the scale the counterweight brings the rotating cylinder back to its highest position, with the next compartment in place to receive coal, and with the cutting off knife thrown back from the descending stream. A mechanical counting device on each scale registers the number of dumps, and the record is repeated by means of an electric connection to a register on the deck.

siderable importance to steamship owners. By the ordinary methods of obtaining coal they must accept the weights given by the coal operators, and they have no satisfactory check upon the accuracy of these weights.

After the coal leaves the scales it slides down the telescopic chutes into the bunkers, where it is taken care of in the usual manner by the trimmers. By the use of a flexible end to the chute it is easy to carry the coal into any corner of the bunker, and thus greatly diminish the trimmers' labor.

The whole crew of the barge consists of six men—namely, the captain, who handles from the deck the levers operating all the machinery; the engineer and fireman; a man at the overhead winch to handle the chutes; a man to oversee the filling of the bunkers; a man in the scale house, who acts as a lookout; the cook.

The Clergue Enterprises at Sault Ste. Marie.

The industrial development that has been going on at the lower end of Lake Superior is progressing with remarkable vigor and rapidity. Millions are spent—already the investment amounts to more than \$12,000,000—and the plans already entered upon call for additional expenditure of nearly as much.

In many ways it is the most striking development under way in America. The entire superstructure of industry is based upon the water power of Lake Superior and the undeveloped resources of the wilderness surrounding this point upon the Canadian side of the boundary. The people of Canada have backed the Government—even pushed it along—in the grants made to the companies that are working here. A year ago these grants included 2,500,000 acres of selected land, some cash subsidies, and timber and other contracts. Now these grants have been increased by 3,000,000 acres of land, \$1,000,000 in cash subsidy for railway construction, more contracts, and the purchase of between \$4,000,000 and \$5,000,000 worth of steel rails, covering a period of five years. If these companies shall require more incentives there is no important movement yet manifest that will deny them, providing the demands appear to be reasonable.

It was no small thing when these companies practically pre-empted the entire water power of Lake Superior. One canal to utilize 20,000 horse-power has been in use some time, a second to furnish 50,000 horse-power is 90 per cent. completed, and a third, to take what there is left after the navigation interests of the lakes have been conserved, is begun. Canal No. 2, the property of the Michigan-Lake Superior Power Company, will be generating power before another spring. In order that

of harbors and connecting channels above might be materially improved, and at a cost far less than the present method of digging the bottoms deeper.

Within the past few days a contract has been let to

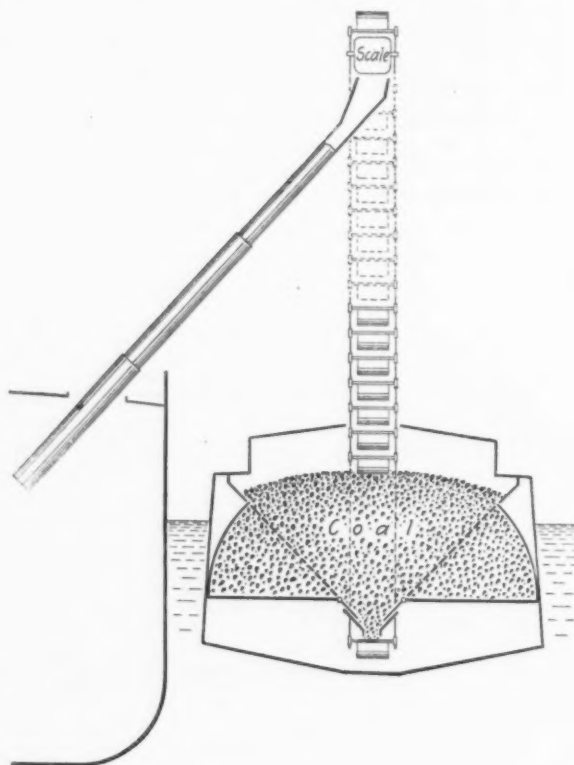


Fig. 9.—Sketch Showing Barge and Vessel.

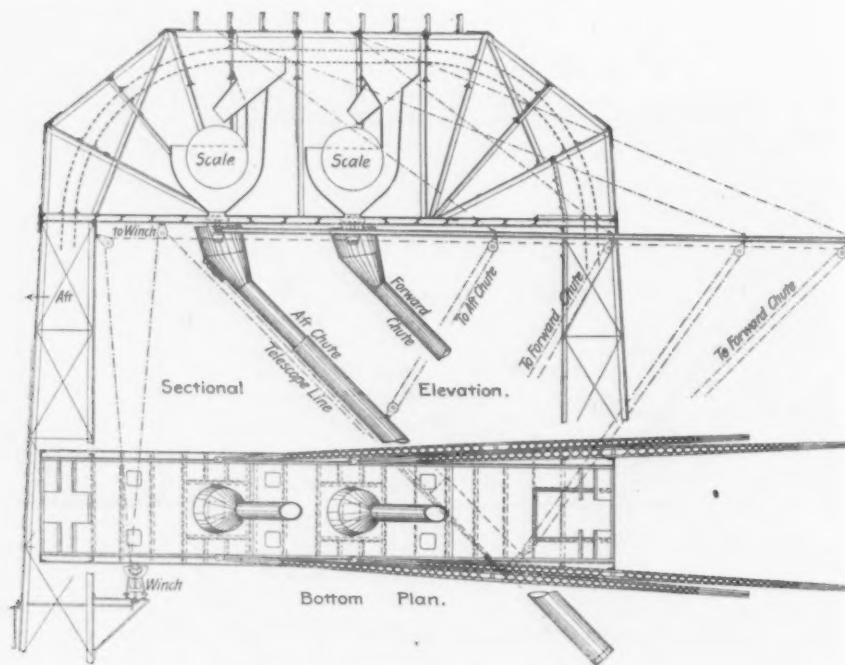


Fig. 8.—Section at Top of Tower.

THE CLARKE AUTOMATIC COALING AND WEIGHING BARGE.

the flow of water through this immense outlet, which is over 2 miles long, has a width of 200 feet and a depth of 22 feet, shall not gradually drain Lake Superior to the enormous loss of marine and harbor interests, the company are letting contracts for damming the great lake, and a great steel and concrete dam 2000 feet long will stretch across the head of the Sault rapids.

Dams for the preservation of the levels of the great lakes have been proposed many years, but no attempt at their construction has ever been made. It is estimated that by the construction of similar obstructions at the outlets of lakes Huron and Erie the water level

the Riter-Conley Company of Pittsburgh for the erection at the Sault of two charcoal or coke blast furnaces of 150 tons daily capacity each. These are to be followed by two more. All will furnish iron for the Bessemer plant and the rail mills now nearing completion. The plant of four furnaces will consume an enormous quantity of wood. Every day 25 acres must be denuded and 600 tons of charcoal produced. Not far from 1000 men must be steadily employed cutting the forest for these furnaces. Nowhere else in America is there under single ownership sufficient woodlands to warrant such an undertaking. But this company have in their grants wood

for the continuous operation of their kilns for a generation.

A demonstration plant for the carbonizing of wood under a new German process will be erected at the works at once. If its claims are proved extensive kilns for the carbonizing of blast furnace fuel will probably be put in. They will produce a quantity of acetate of lime, from which acetic acid will be made by treatment with sulphuric acid produced by the company, and they will furnish a large share of the wood alcohol of the United States. Acetic acid to take the place of European importations will probably be produced.

A 600-ton rail mill will be in running order this year. Its two 5-ton Bessemer converters are already swung and its rolls going. The buildings are all of stone, a beautiful banded sandstone similar to what all the works of the company are built of, and its foundations are all concrete. Very little of the material brought from the abandoned Dansville works will be utilized, and the mill is expected to be as fine as skill and ability can make it. Though not so large as many of the American works, it is proposed to build a model plant for its size. D. D. Lewis, who built the works of the Lorain steel mill, is in charge.

In addition to the rail mill an open hearth plant will be put in and a tube mill erected. This will probably make certain special high grade tubing valuable for special work.

A great sulphur reduction works is about completed and will be at work shortly. This will treat pyrrhotite ores from the company's Sudbury mine for the extraction of sulphur. A sulphurous anhydride plant is going up; a sulphite pulp mill is completed and is now being connected with the ground wood pulp mill, so that the products of the two can be mixed and sold as a part sulphite product, and all the works based upon the wood and pyrrhotite will be in operation, it is expected, in a few weeks.

Work on the No. 3 canal, the second on the Canadian side of the line, was started in order to provide stone for the steel mill, and the prism of the canal forms a convenient quarry. This canal will be nearly as large as that on the American side and will furnish 40,000 horsepower. Its uses will be metallurgical, and a refinery for the treatment of ores of copper and other Canadian minerals will be erected. It is expected to treat ores from the far West as well as those that may be mined near at hand. The power house for this canal will be at the lower end of the works, and for $\frac{1}{2}$ mile below its waste weir there will be docks and terminals for the various transportation enterprises connected with the operation.

These transportation enterprises are large. They now include the Algoma Central Steamship Line, running four large freight steamships and two consorts, and several passenger boats connecting the several locations of the enterprise. There is the Algoma Central Railway, designed ultimately to run to Hudson Bay, and immediately to the Canadian Pacific Line, 130 miles north from the Sault. This line is completed for 40 miles and contracts for nearly 100 miles more have been let. The Helen mine road is completed to that mine, 12 miles back from Lake Superior and 125 miles north of the Sault, and is being laid to the newer Josephine mine, 11 miles further inland. The Manitoulin & North Shore road is planned to run easterly from the Sault to make connection with transcontinental lines and open mines along the company's grants. A portion of the road through the Sudbury region has been completed and has already opened several fine nickel mines.

Harbor and dock facilities for ore shipment are to be greatly increased immediately by the addition of ore cars and the building of storage tracks at the dock. The mining equipment is being enlarged by a second ore crusher, now under way; by a steam shovel for loading at the mine and by stock pile room for extensive winter mining. Helen ore, though containing some sulphur, is not injured thereby, as the pyrites occur in distinct boulders and masses. Last year's average of sulphur was only 0.028 per cent. At the mine there is now a cube of ore body shown up by drilling and explorations

that is approximately 1000 x 400 x 200 feet. If all this cube is ore there is a tremendous mine. The Canadian Geological Survey regards it as commensurate in importance with the great deposits of Minnesota and Michigan. When I examined the Helen a year ago and reported what I had seen in *The Iron Age* there was much doubt expressed, and some lake mining men went so far as to say there were not over 1,000,000 tons, and all sulphur. The appearance of the mine to-day does not bear out these pessimistic ideas. From that time to this there has been a wonderful change, too, in the appearance of the company's railroad and other works. The Helen mine road was a pretty tough looking line, which was natural, as it was just completed and through a wilderness. Now all is changed. The road has been practically rebuilt, and work that on most lines would have waited for years has already been done. All the great trestles are solid filled, the timber bridges are replaced by girder bridges and concrete piers and abutments, the ditches and culverts are of concrete, steel and masonry, and the track is laid with 85-pound steel. There is a large equipment of 50-ton cars and 110-ton locomotives; buildings and equipment have a finished and permanent look that is most remarkable. D. E. W.

The Inland Steel Company.

The Inland Steel Company, Marquette Building, Chicago, have purchased 50 acres of land in a most eligible location for their new steel works. The tract is located on the shore of Lake Michigan, in Indiana, just east of South Chicago, and near the town of East Chicago. The locality will be known as Indiana Harbor. The company have already let most of the contracts for the buildings, which are all planned with a view to future extensions. The office building will be two stories high, and of brick, but the other buildings will be of steel construction. The open hearth building, 120 x 900 feet in dimensions, will contain the blooming mill and four 50-ton furnaces with a daily output of 400 tons of basic open hearth steel. Two finishing mills will be built, one 80 x 300 feet and the other 160 x 650 feet. The machine and blacksmith shop will be of steel construction, 70 x 150 feet. The Inland Steel Company will make a specialty of the production of open hearth steel on a large scale. The product will be billets, slabs and merchant bars. Later on blast furnaces will be built. There is abundant room for this purpose. A part of the production in billets will be shipped to the plant of the Inland Steel Company at Chicago Heights. The Indiana Harbor Works will have the best railroad connections, being on the Lake Shore & Michigan Southern; Pittsburgh, Fort Wayne & Chicago; Baltimore & Ohio; Michigan Central; Chicago Terminal Transfer; Elgin, Joliet & Eastern, and Chicago Junction railroads. Contracts for the steel frame buildings so far let have been taken by the Indiana Bridge Company of Muncie, Ind. The Inland Steel Company have selected R. J. Beatty as general manager of the Indiana Harbor Works. He was formerly president of the Midland Steel Company of Muncie, Ind., and continued as general manager of the works for some time after their acquisition by the American Sheet Steel Company.

The Illinois Steel Company.—The following officers were elected at the annual meeting in Chicago last week: Directors: C. M. Schwab, E. H. Gary, E. J. Buffington, C. H. Foote, E. Shearson, E. C. Converse, Percival Roberts, Jr., T. W. Robinson, W. L. Brown, K. K. Knapp, T. J. Hyman. Officers: President, E. J. Buffington; first vice-president, C. H. Foote; secretary and treasurer, T. J. Hyman. Executive Committee: E. J. Buffington, E. H. Gary, C. M. Schwab, C. H. Foote, T. J. Hyman.

The Pressed Steel Car Company of Pittsburgh have received an order for 250 steel gondola cars, for use on the Government's railways in New South Wales in Australia. The cars in make up will be somewhat similar to those now in use in Australia, except that they will be all steel instead of wood.

The Pressed Steel Box Car.

BY JOHN M. HANSEN, CHIEF ENGINEER PRESSED STEEL CAR COMPANY.

The subject of steel underframes to replace ordinary types of wooden car equipment has received much attention in the past year. As a result a large number of cars have been equipped with underframes of various types. Practically all of these have been made of pressed steel, although several designs of underframes have been suggested which are composed almost entirely of rolled shapes.

In the past nine months the wooden car department of the Pressed Steel Car Company alone have built over 6000 cars with wooden bodies of ordinary design supported by a steel underframe in place of wooden sills.

tween the end sills and side sills is strengthened against distortion by a gusset plate, to which a diagonal brace is attached. The other end of this brace is attached to center sills at bolster. The intermediate stringers, or nailing strips, are supported at short intervals by cross braces, which are riveted to side and center sills. These braces also serve to keep the frame square, and in case of a local load directly above the center sills these braces convey part of the load to the side sills, where it can be more readily cared for. This frame, with attachments for wooden upper structure, is shown in Figs. 3 and 4.

The advantages of the steel underframe are greater than was at first foreseen. The strength of the car is, of necessity, made ample for 80,000 and 100,000 pound loads, as it is scarcely possible to obtain sections of steel which are light enough to make 50,000 and 60,000 pound cars economically. By the use of a steel underframe it is

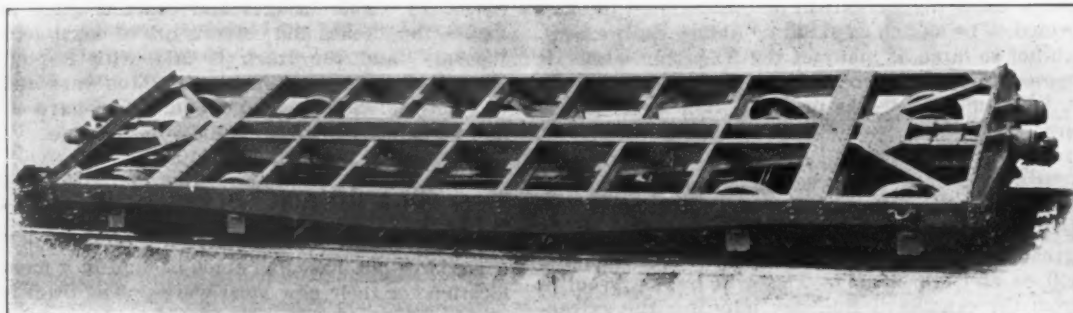


Fig. 1.—Pressed Steel Underframe for 80,000-pound Box Car.

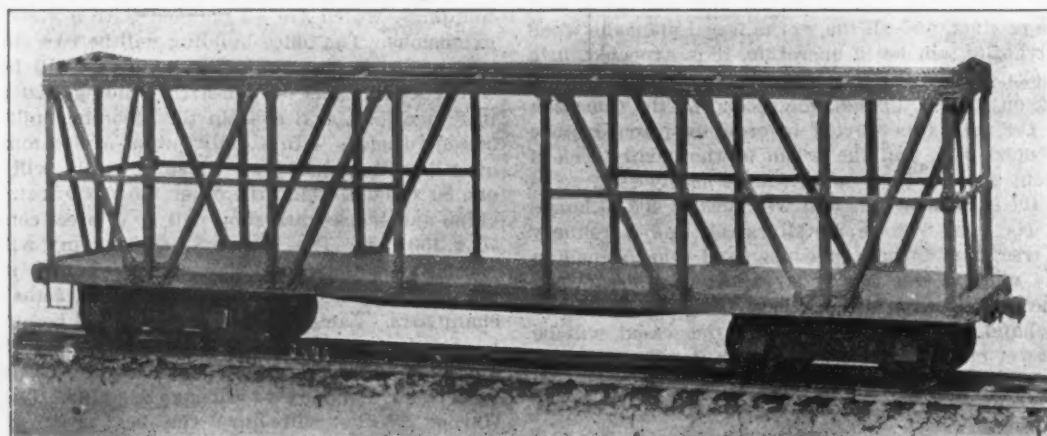


Fig. 2.—Complete Pressed Steel Frame for 80,000-pound Box Car.

PRESSED STEEL BOX CAR.

The underframe illustrated in Fig. 1 has been used on a large number of P. & R. box and gondola cars built by the Pressed Steel Car Company. It consists of two center and two side sills, of pressed steel standard type, 17 inches deep at center, extending continuously from end sill to end sill. Each section of this sill is of channel form. The flanges form an ample bearing surface to which wooden nailing strips can be bolted, and also afford abundant opportunity for riveted connection with top and bottom flanges of end sills and bolsters. The bolster is of a box girder section, the web of which consists of channel shaped diaphragms, which are flanged on all sides to allow center sills to pass through and still furnish riveting surface sufficient to connect the ends of these diaphragms, and thus get the efficiency of a continuous bolster. The tension and compression members of this bolster consist of flat tie plates extending continuously the entire width of the car, passing above and below the center sills, thus holding the latter securely in place. The end sills of the car constitute girders which assist in distributing a part of the force due to end shocks from center sills to side sills. The connection be-

possible and practical to build an 80,000-pound furniture car (or a car for any other bulky commodity) with truck centers 50 feet apart, if so desired. With a wooden underframe it would be literally impossible to place sills close enough together and make trussing deep enough to accommodate such a span. There is not room enough between top of rail and top of floor in the ordinary design of wooden cars to truss the sills sufficiently to carry the load which an 80,000-pound car is expected to carry across a span of 50 feet, unless an excessive number of sills and truss rods are used, which would make the weight of the car so great that it would be an impracticable construction. By the use of steel sills, such as are manufactured by the Pressed Steel Car Company, it is possible to get a girder which is practically of uniform strength at all sections. The weakest point of the wooden sill is, under ordinary circumstances, at the center of the car. The truss rods, which, in a new car with wooden sills support the greater part of the vertical load, soon lose their initial tension, and allow the sills themselves to carry the greater portion of the load. It is at this time that the weakness in the sills develops.

With a pressed steel sill, such as that described above, it is possible to make the sill stronger at the center than at any other point. This, it is claimed, cannot be done with wooden sills. The portions of the center sills between the bolsters are called upon to stand compression due to blows sustained by the draft rigging. In this case, also, the weakest point of the wooden sill is at the center of the car. The tie rods, which help to strengthen the car against a vertical load, only serve to exaggerate this weakness. The humping up and breaking at the center, which frequently causes the destruction of a long flat car when it sustains heavy end shocks, is prevented by the use of a steel frame.

Inability to resist end shocks is one of the most fatal weaknesses of present car construction. The under-

Since the adoption of the steel underframe has proven of such great value, another move in the same direction has been suggested, and is being adopted with equal rapidity for box car service. In addition to a steel underframe, cars are now being designed with steel posts, braces, side plates, end plates, carlines, &c., thus making the frame of a box car a complete riveted structure. Fig. 2 illustrates a complete steel frame as built by the Pressed Steel Car Company, and Figs. 5 and 6 show in detail the construction of a car having such a frame. The posts and braces are U shaped.

A nailing strip, to which the lining is secured, is bolted on the inside of each post. The side and end girths are of U-shaped section, and form a continuous steel band encircling the entire car, with the exception of the door

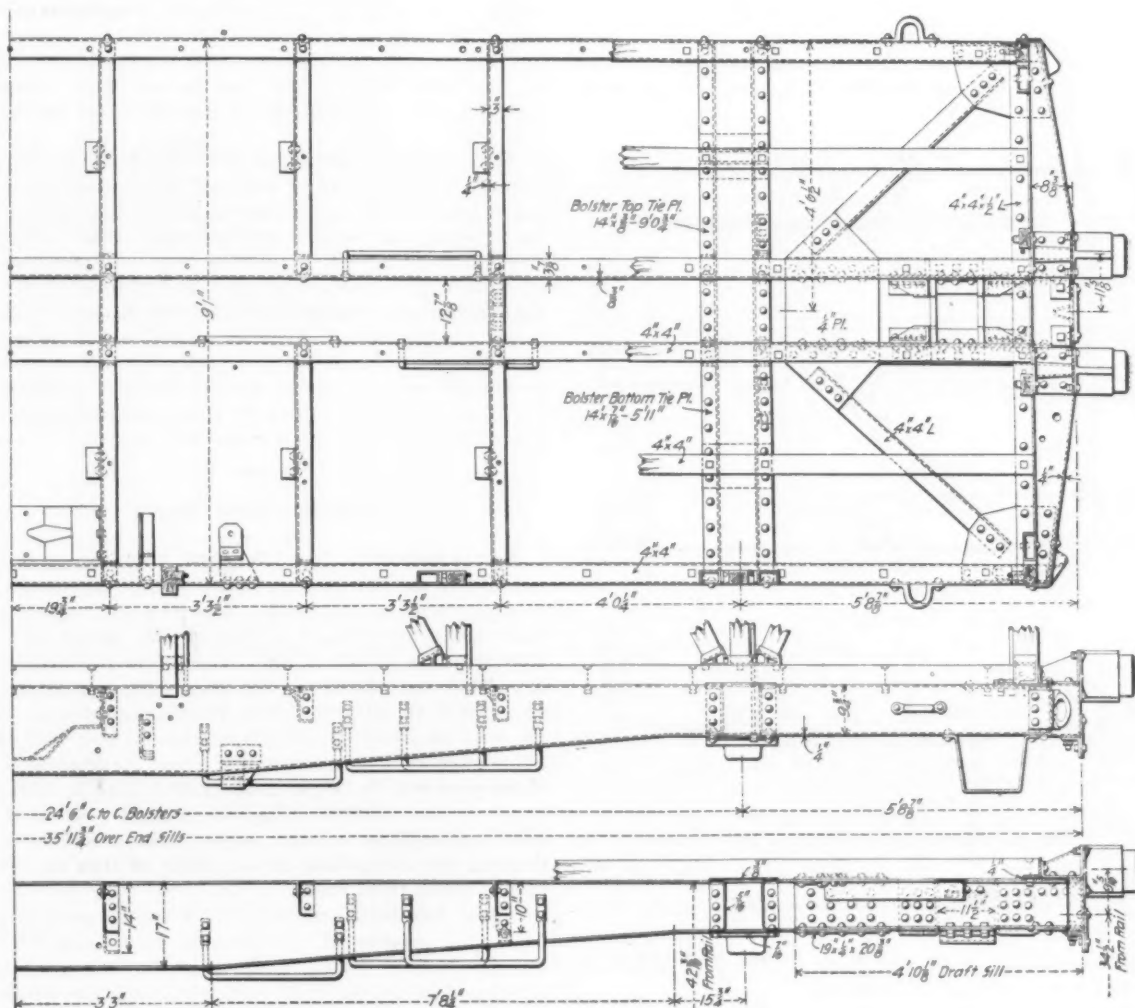


Fig. 3.—Details of Pressed Steel Box Car.

PRESSED STEEL BOX CAR.

frame described above affords abundant opportunity for exceptional strength in this direction. The diagonal braces which are shown in this design of underframe form the tension members of a truss by which compression of the draft sills is partially communicated to the side sills. These same diagonal braces act as compression pieces to convey the shocks sustained from pushing on the corner of the car, where the push pole is applied, to the center of the car, where they are readily absorbed by the bolsters and center sills. In a box car a common casualty is for the end post to be broken out at the bottom. In Figs. 1 and 3 an angle is shown riveted to the top flange and the bottoms of the end posts and braces are secured behind this angle. The end posts and ends of the car cannot, therefore, break away from their connection at the bottom without tearing off or bending this angle. The strength of the end of the car is thus limited only by the strength of the opponent timbers, and not by the strength of the various joints.

openings. A nailing strip is also placed inside these girths, and others are placed along the side plate and side sills, forming a nailing surface for car siding. The side plate consists of a channel section running from end to end of the car. The end plates are angle sections, and are riveted at their ends to the side plates. The side plates are further connected by carlines of U-shaped section. The carlines have curves pressed in them into which the purlines are fitted and bolted.

The practical advantages to be derived from this steel upper frame are probably as great as, if not greater than, those derived from the steel underframe. The wooden box car has long since reached its limit as regards capacity and durability. The metal frame which is now being introduced opens the way for increasing the capacity and life and reducing the cost of maintenance of box cars. The 100,000 pounds capacity box car will form a considerable part of the cars manufactured in the near future. It is needless to argue the economy of a 100,-

000-pound car by comparing its cost and paying load with the cost and paying load of a 60,000-pound car, as this was discussed exhaustively before the use of 100,000 pound hopper and gondola cars became so common. The superiority of a steel structure as compared with a wooden structure to withstand the elements has been discussed and acknowledged in many other branches of engineering than car designing, and it is, therefore, unnecessary to advance any arguments along this line. Suffice it to say that wooden bridges on railroads all over the country have been replaced by steel bridges, and wooden buildings by steel buildings. These facts make it reasonable to assume that it is only a question of time until wooden cars will all have been replaced by steel cars. A virtue which is seldom advanced for a steel frame lies in the fact that fire has no effect upon it. This was clearly illustrated in a recent fire which involved a car with a metal frame. The fire entirely destroyed all wood work on the car, but left the frame in good condi-

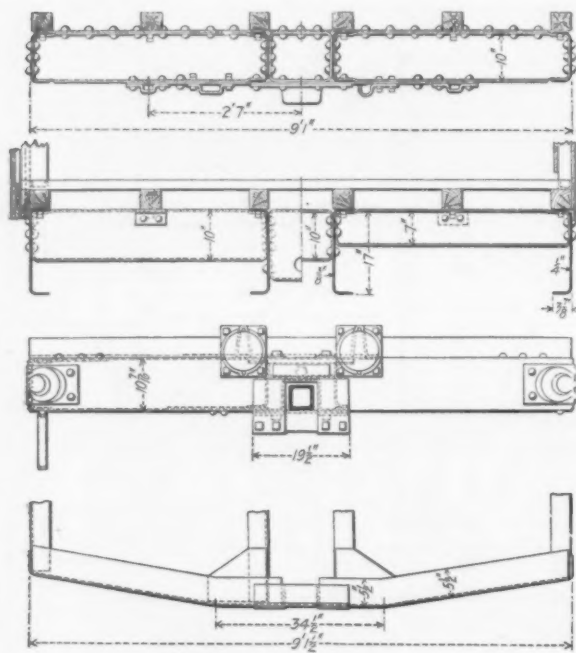


Fig. 4.—Details of Pressed Steel Box Car.

PRESSED STEEL BOX CAR.

tion, thus averting 30 per cent. of the loss which a wooden car would have sustained.

Whereas it is undoubtedly a fallacy to design cars to withstand wrecks or unfair usage, yet the fact that steel cars and steel underframes do withstand wrecks which result in total destruction of wooden cars is certainly a point in their favor. The question has always been, "Where does fair usage end and unfair usage begin?" The use of steel frames has been of great value to railroad companies in that it has widened the limits of what is considered fair usage, and narrowed down the amount of usage which can be termed unfair. Without any visible signs of extraordinary usage a steel frame has frequently been known to stand what has in the past been considered unfair usage, inasmuch as it resulted in demolishing wooden cars.

With the steel frame illustrated in Fig. 2 the entire side of the car becomes a steel truss, the necessity for the heavy side sills used in the steel underframe immediately disappears, and even then the side of the car is still at least 50 per cent. stronger than the vertical load can possibly require. The reason for this is that in addition to supporting this vertical load the posts and braces must also resist the centrifugal force, or bulging effect, which results from rounding curves at high speed with a loaded car.

To give a general idea of the efficiency of the steel post, or brace, to stand compression, or to show the abil-

ity of a steel upper frame to support a vertical load, the following comparison is made:

The prevailing practice in wooden car construction is to secure a post merely by putting it in a malleable iron shoe, which means nothing more than a hinge or pin connection. The method of securing steel posts is to rivet them to the side plate or side sill, thus making it fixed or rigid at both ends, which gives the steel post a great advantage over the wooden post. However, overlooking this advantage, and comparing the U-shaped steel post shown in Fig. 2, made of $\frac{1}{4}$ -inch plate, with a solid oak post of the same over all dimensions, it is found that the wooden post is capable of standing only 30 per cent. of the load that a steel post of equal length can carry with safety. In the computation, the result of which is given above, a wooden post is assumed as capable of standing a maximum fiber strain of 1000 pounds per square inch, while a steel post is assumed as capable of standing 12,000 pounds per square inch. These assumptions are certainly fair or possibly favor the wooden post.

To show the advantages of a steel post vs. a wooden post to resist bulging or bending, calculations have been made which clearly demonstrate that a steel post, acting as a beam, can resist three times the force that would break a wooden post of the same over all dimensions and of $\frac{1}{4}$ inch thickness. The steel underframes and upper frames here considered are both steps in the direction of a box car the outside covering of which will be entirely of steel. Considerable interest attends the developments in freight car equipment which will take place within the next year and the 100,000 pounds capacity steel box car will probably play an important part.

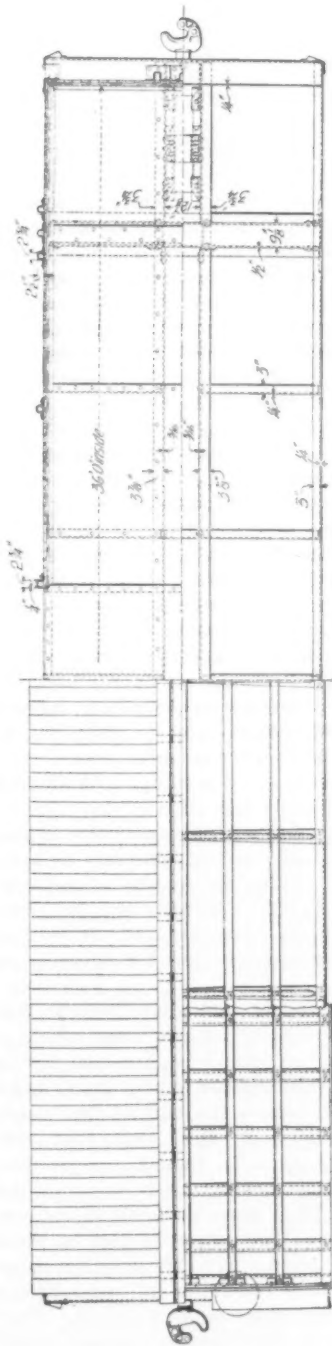
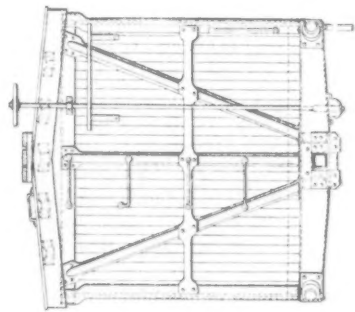
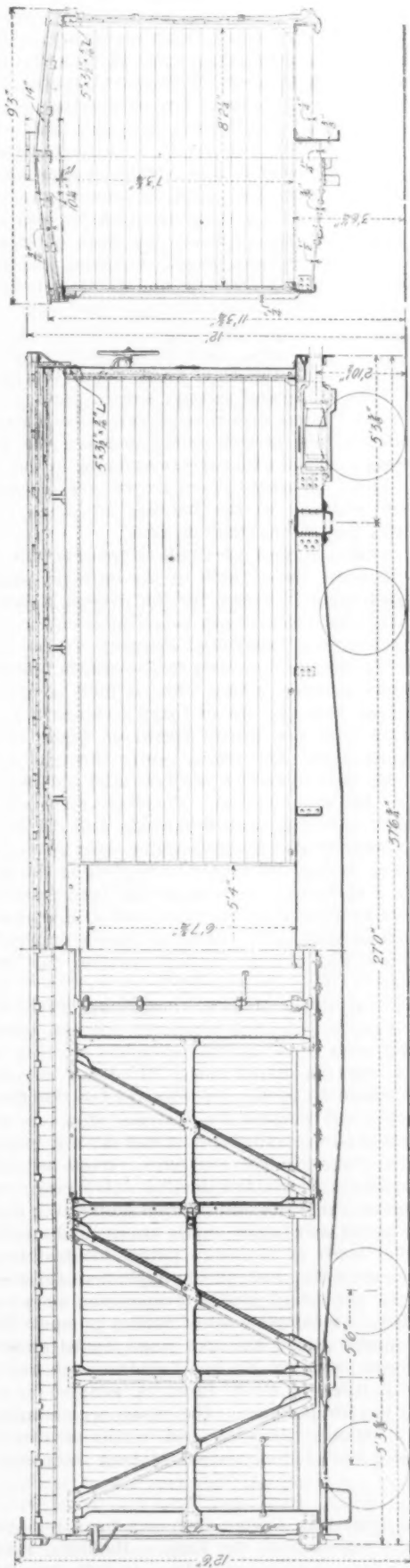
Pacific Coast News.

SAN FRANCISCO, CAL., June 10, 1901.—Everything is now ready for the harvest, which will be one of the best ever garnered in California. The men who supply grain bags some time since estimated the cereal crops at 1,000,000 tons of wheat and 750,000 tons of barley, oats, &c. Then we will have a big crop of fruit—a large yield of everything save cherries, prunes and pears. It is too soon to estimate the grape crop. There will be an abundance of sugar beets and other vegetables. The citrus crop will be 20 per cent. greater than in 1900, and, in short, the producer will have a good time of it this year and will be a large buyer. There will be a big demand for everything in the shape of iron or steel or that is made from them.

There has been somewhat of a lull in general business; still, despite all, the Clearing House charges keep up wonderfully well. They have for the past three months been in excess of last year, with the single exception of one week, and there the difference was light. One week, however, the Clearing House clerk reversed the figures and for a while we supposed there was a big slump. It would, however, be idle to deny that the great strike has made some difference. You cannot all at once bring to a full stop all the institutions that employ 7000 men, the great shipyards, rolling mill, foundries, boiler shops, machine shops, &c., without making the difference felt. It is a mighty army of workers and it has now been idle three weeks. No special attempt has been made to fill the places of the strikers, and but for the silence that now fills the places that erstwhile were so noisy and full of life no one would suspect that anything unusual had occurred. Some small shops are at work, but beyond that nothing is being done, and now the molders have quit work too. All parties to the contest are dumb as to any negotiation being in progress for a settlement, but I suspect that now an attempt will be made to fill the strikers' places. We pay higher wages here than you do in the East—20 to 25 per cent. higher—and to give nine hours and higher pay than their Eastern competitors would simply make it impossible for them to compete. The fight is not a local one, but has been forced on the coast by the governing body of the Eastern machinists. As the employers of the Eastern men are competitors for the trade of this coast it is felt

that our home machinists should have given the matter a second thought. The strike epidemic is now in the air and no one can tell what will happen next. The men probably thought that on account of the amount of

to work on steel tanks for the sugar planters at Kahalin. The employees of the rolling mill department and others in the Judson Iron Works at Oakland have left work, too. A union was formed to affiliate with the Amal-



Figs. 5 and 6.—Sectional Elevations and Plan of 80,000-Pound Pressed Steel Box Car.

PRESSED STEEL BOX CAR.

work going on the strike could not last long, but they were mistaken, and if the truth were known many are now cursing it in their inmost hearts. Occasionally some of the strikers get an odd job of work, and 30 boiler makers have gone down to the Hawaiian Islands

gamated Association of the Iron and Steel Workers of America. All this has dealt a blow at the oil industry, which has been rather quiet for a month or so. All the leading foundries, iron works, &c., had begun to use oil, but as

they are now idle there is a market for a large quantity, temporarily shut off. On the other hand, nearly all the producers of the Coalinger district have signed an agreement to sell at 65 cents a barrel at the well and 70 cents delivered at the point of shipment. The production is going on increasing, and Kern County in May shipped 50 per cent. more oil than in April. There is no question that, with the possible exception of Texas, this State is bound to be the banner oil State of the Union, and that among all its products oil is bound to be king. In Northern California development work is going on actively and the oil sells at a much higher price than that from the southern part of the State. The great trouble of the oil producers of the Interior is the freight rate, which is 46 cents a barrel, including switches, and which is looked upon as practical confiscation. But the railroad has promised reduced rates as soon as it gets its new cars in commission.

J. O. L.

The Condition of the Coal and Iron Trades in Scotland.

GLASGOW, June 6, 1901.—The event of the week here has been the settlement of the wages question in the coal trade. As previously reported, the Conciliation Board being unable to come to an agreement over the demand made by the coal owners for a reduction in wages of 1 shilling per day as from May 1, decided to call in an arbiter. Lord James of Hereford, who has acted in a similar capacity with much approval in other cases, was chosen as neutral chairman in arbiter. This week he presided over the board in Glasgow, and heard the representations of the delegates of the masters for, and those of the delegates of the men against, the proposed reduction. And he went into all the facts and figures submitted. Finally he decided that there should be a reduction of 12½ per cent. on the 1888 basis, to take effect from now and to last until July 31. This is just "splitting the difference." The employers asked for a reduction of 1 shilling per day; Lord James' award is equal to 6 pence. The employers wanted the reduction to date from the expiring of the last period from which the rate was fixed by the Conciliation Board—viz., the first day of May; Lord James' award dates it from today. The men have thus had about six weeks at the unreduced rate, and have once more scored by their diplomacy. Almost everybody expected that if the arbiter allowed the shilling he would not date it back, but he only allows 6 pence. Coal owners, however, have no great cause to complain, though they do complain, for up till now they have been getting good prices. It is true that quoted rates are from 5 shillings to 6 shillings per ton under those quoted at this time of the year, but last year coal owners were not averaging the quoted rates, as most of them had running contracts at lower figures. This year, for the first six months at any rate, their averages should be fully better than last year, when wages were about the same as now. It was not till August that the maximum wage of 8 shillings per day was reached.

If ironmasters were to get immediate benefit from the reduction in colliers' wages the iron trade would be relieved all round. But the price of splint coal for the furnaces was fixed at 9 shillings per ton for June, and is not likely to be reduced before the end of the month. There are so few sellers of this coal that they command the situation. As it is, though two or three furnaces were relighted last month, others were put out, and there are now only 76 in blast in Scotland, as compared with 85 a year ago. The output of pigs is, therefore, about one-seventh down. Yet this does not affect the warrant market, which continues dull and lifeless at 2 shillings to 3 shillings under makers' prices. There are not now 60,000 tons in the Glasgow warrant stores, though there are over 75,000 tons of Cleveland iron in the Middlesbrough warrant stores. Finished iron makers are only buying from hand to mouth, but steel makers have been buying hematite pigs more freely and some have covered themselves up to the end of July, as if of opinion that there will be no break up in prices before then. Perhaps not, but holders of warrants de-

clare that there will be no break in prices at all, and cling to their holdings. There has been more buying of steel ship plates of late, but Scotch makers have to accept very low prices in order to keep out North of England plates, which are quoted £5 15s.

The prospects of the shipbuilding industry are brighter than they were. Last month the output of the Scotch shipbuilders was about 56,000 tons, a total to which the new steamer "Haverford," launched by John Brown & Co., Clydebank, for the International Navigation Company, contributed 11,500 tons, and which was further swollen by two big P. & O. liners, launched by Caird & Co., Greenock, and Alexander Stephens & Sons, Glasgow, respectively. And the new contracts booked during the month are computed to have been not much short of 50,000 tons. Since the close of May several large orders have been placed, including two more P. & O. liners, each of 10,000 tons and 11,000 indicated horsepower. In point of fact, the tide has turned and the flow of new orders is beginning to equalize the completion of old contracts. This insures activity in most of the yards—in all the chief yards—until the end of the year, at any rate, and perhaps longer. And it is known that a good many orders have yet to be placed by the established lines, as well as the contracts the Admiralty will have to place with private builders, in the course of the autumn. Whether prices are yet low enough to give another stimulus to the building of cargo tramps is doubtful, but it will come in time.

A notable output of Clyde shipyards this week is the "Kumano Maru," built by the Fairfield Shipbuilding & Engineering Company for the Nippon Yusen Kaisha of Tokio, and the fifteenth vessel built on the Clyde for this enterprising Japanese company. The "Kumano Maru" is 415 feet long, 48½ feet broad, 30 feet deep, and her gross tonnage is 4800. She is built of steel on the three-deck principle, up to Lloyd's standard and in accordance with the British Board of Trade regulations for passengers. She has a center through plate keel, with side bars to form a bar keel, and a double cellular bottom, for water ballast. There are eight water tight compartments with steel bulkheads, and the double bottom is also divided by steel water tight doors and girders. For cooling and otherwise regulating the air of the cabins a system of brine pipes has been installed from the refrigerating machine connected with Stewarts' patent thermostatic coils. There are also a number of electric fans, and a large cooling chamber for fresh provisions.

The "Kumano Maru's" propelling machinery consists of one set of triple expansion engines, surface condensing, with three inverted cylinders working on three cranks, and the horse power 31 inches diameter; the intermediate 51 inches diameter, and locomotive power 85 inches, all adapted for a stroke of 4 feet 6 inches. The horse-power cylinder is fitted with a piston valve and the other cylinders with slide valves, all worked by the double eccentric link motion valve gear, controlled by a combined steam and hydraulic reversing gear. The crank thrust and tunnel shafts are of mild steel and the propeller shaft of Morison's patent lockfast iron. The engines are fitted with all the appliances for economical working, with feed heater, evaporator, air pump, &c., and there is a complete set of donkey pumps. There are three double ended and two single ended steel boilers; the former with six Morison furnaces each and the latter with three, in all 24 furnaces, adapted to work up to 185 pounds pressure. The passenger accommodation is of a superior character and worthy of what is now becoming one of the greatest shipping companies in the world.

B. J.

The American Bridge Company have removed their drafting offices from the Empire Building, Pittsburgh, to their own new office building, at Fifty-first and Butler streets, in Pittsburgh, which have just been completed. The new building is three stories high and has been built to suit the needs of the clerical forces and draftsmen of the American Bridge Company. The offices of the contracting department will remain in the Empire Building.

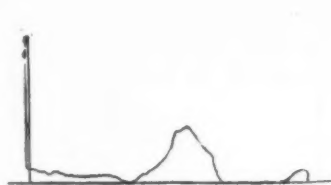
The Flow of Metal.*

BY HENRIK V. LOSS.

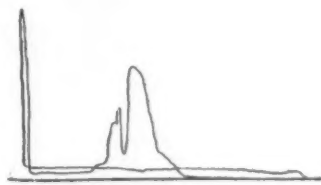
A little more than a year ago I had the honor and privilege of laying before you a synopsis of a series of experiments on the "Flow of Steel," covering researches made at intervals during the last 10 to 15 years. The Institute was pleased to send out advance copies of my lecture, thereby securing a very thorough and exceedingly interesting discussion. It gave me great pleasure to know that the major points covered by my work found such liberal and hearty reception, and that the only chapter to which any exception was made at that time was the one covering the resistance to punching. Several of the learned members of this section criticised my assertion that the ordinarily accepted and standard ultimate for punching steel should be reduced 30 per cent or more. I told the members of the section at the time that the strangeness of this result came to me originally with as much surprise as it then did to them, and there seemed to be a desire on the part of several of the engineers present during the evening to inaugurate a series

five and six times as great on a power machine as on one driven by water pressure, and herein undoubtedly lies the solution of the problem. With this in view, it seems to me that the proper way to build a power punch is to have at least two different speeds—a slow one for penetration and a quicker one for the return movement. It has also lately come to my notice that some of the original experiments made by Hoopes & Townsend a number of years ago were based upon this principle, and that the large nuts penetrated by small punches were only made possible upon the above-mentioned basis.

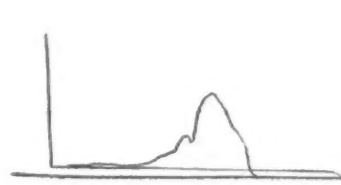
In laying before you my experiments, made since my last paper, I wish to say that the present ultimates are a little higher than those originally given. The reasons for this may be many; possibly a little higher carbon steel, or a little more resistance in the machine upon which they were conducted, as compared to the multiple machines used in my previous work; or again, the fact that our plates are all a little below size. In my former experiments the plates were not micrometered, having been given the benefit of the full round dimension, while with the data given you to-night the sheets have been more carefully measured up. With beveled punches the



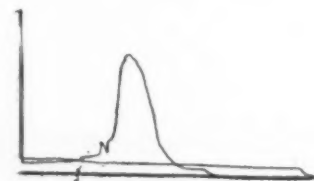
Plate, $\frac{1}{4}$ Inch Steel; Punch, 15-16 Inch Diameter (Beveled); One Hole.



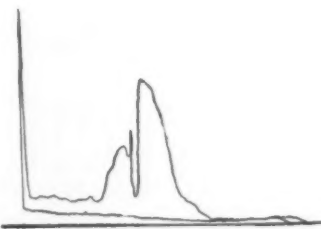
Plate, $\frac{1}{4}$ Inch; Punch, 1 1/32 Inches Diameter (Flat); One Hole.



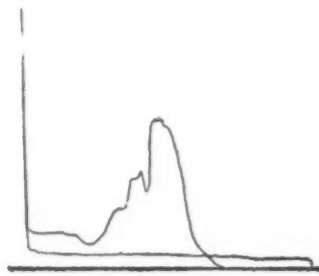
Plate, 5-16 Inch Steel; Punch, 15-16 Inch Diameter (Beveled); One Hole.



Plate, 5-16 Inch Steel; Punch, 1 1/32 Inches Diameter (Flat); One Hole.



Plate, $\frac{3}{4}$ Inch Steel; Punch, 1 1/32 Inches Diameter (Flat); One Hole.



Plate, 7-16 Inch Steel; Punch, 1 1/32 Inches Diameter (Flat); One Hole.

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of individual and separate experiments, with a view of proving or disproving my statements. The burden of the argument seemed to be that punching could not possibly require less power than shearing. I shall not discuss that aspect of the case to-night, but will confine my arguments to the field of my original assertion—viz., that the accepted power to punch steel is decidedly an unnecessarily large one.

I frankly admit that when presenting my last experiments in this particular field I did so aiming at nothing more than to lay certain new facts before you, having no intention whatever of explaining their causes, as, up to that time, I had not been able to analyze them myself.

This evening, in adding whatever new data I possess, I wish to accompany them with the expression, as my own conviction, that the reason for the low ultimate for punching lies in the fact that the punching machinery as hitherto used, and with which experiments have formerly been made, were power punches, possessing great speed of penetration, while the experiments conducted by me have all been confined to hydraulic machines, where the velocity of the flow of metal during the process has been entirely under the control of the operator. Speaking in a general way, I find from observation that the speed during the actual punching was from three to

original experiments averaged about 35,000 pounds per square inch, while the data given in the table below give about 42,000 pounds, increasing with the thickness of the plate. Flat punches gave about 25 per cent. In addition, or about 40,000 to 42,000 pounds for old punches (and somewhat less for new ones), while the present experiments give about 45,000 to 46,000 pounds. It is also seen that with a flat punch the ultimate seems to be nearly constant and not depending upon the dimension of the plate; and furthermore it is interesting to note that when $\frac{1}{2}$ or 9-16 inch plate is reached the effect of the beveling disappears, the ultimate being the same for both flat and beveled punches.

This is in perfect harmony with my results found on shearing, which were that with $1\frac{1}{4}$ or 2 inch plate the beneficial effect of a beveled knife disappeared.

The ultimate of the steel tested was about 60,000 pounds per square inch, and made by the basic open hearth process.

I have very little more to say, having confined my work exclusively to meeting your criticisms upon the subject of punching. If any one of you should have conducted any similar experiments, I should be very much pleased to know the results. I want to give to you to-night, for your own inspection, the original cards upon which the figures are based. They were taken at two different works, both belonging to the Pressed Steel Car Company in Pittsburgh, and conducted by two different

* Paper read before the Franklin Institute, Philadelphia, from the Journal of the Institute for June.

men, but, withal, you can see how well they agree. The subject is an important one, as we all know, and when a year or more ago I was confronted by men of your standing and ability taking a strong stand in opposition to the results attained, I felt it my duty to proceed with the work. It is perfectly natural and justly right that our text books, representing accepted standards for years and years, shall be respected, only to be thrown aside when refuted by indisputable evidence, and if my work in the field of "The Flow of Steel" has merited the recognition of my profession, I shall consider myself fully rewarded for my task.

Average Ultimates.		
Thickness of Plate, Inch.	Beveled punch. Pounds per square inch.	Flat punch. Pounds per square inch.
1/4	First series..... 40,000	49,600
	Second series.....	
5-16	First series..... 39,500	46,000
	Second series.....	
3/8	First series..... 42,800	30,000 (?)
	Second series.....	
7-16	First series..... 41,150	41,000
	Second series.....	
1 1/2	First series..... 42,400	
	Second series..... 44,100	38,500 (?)
	First series..... 45,600	
9-16	Second series..... 45,750	45,500
	Third series..... 45,000	

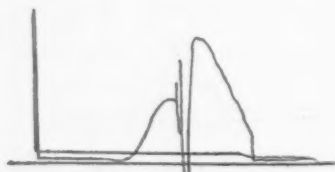
however, been a very instructive one, and has yielded much information in this matter not heretofore made public.

MR. LOSS'S REPLY.

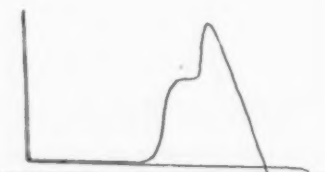
Mr. Loss: Referring to Mr. Christie's remarks on the questions of speeds with which my experiments on punching and shearing were made, I have already fully stated to-night that herein lies the solution of the problem of low ultimates. I have indicated in connection with my last experiments, and which have been laid before you to-night, the speed of the punching, this being from one-third to one-fifth of that used in geared power machines.

As to the velocity used in shearing, however, I wish to say that they were practically the same—viz., a little higher for very thin dimensions, becoming slower, even up to the point of stalling the hydraulic press for the greater thicknesses, and in this last instance producing a card similar in effect as the punching card given to you to-night, and to which card was attached a note, giving 15 seconds as the time for penetration.

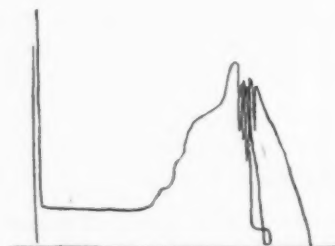
I think, however, that the aim and purpose resulting from my experiments, and to which I wish to call the



Plate, 7-16 Inch Steel; Punch, 15-16 Inch Diameter (Beveled); One Hole.



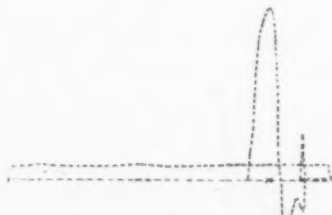
Plate, 1/4 Inch Steel; Punch, 15-16 Inch Diameter (Beveled); One Hole.



Plate, 9-16 Inch Steel (Full); Punch, 15-16 Inch (Beveled); Time, 15 Seconds to Penetrate One Hole.



Plate, 3/8 Inch Steel; Punch, 15-16 Inch Diameter (Flat); Five Holes.



Plate, 0.525 Inch; Punch, 0.937 Inch Diameter (Beveled); Four Holes.



Plate, 0.552 Inch; Punch, 0.937 Inch Diameter (Flat); Three Holes.

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Figures under flat punch for 3/8-inch and 1/2-inch material (second series) were taken from a plate which was not micrometered. That they are somewhat lower than the rest may be caused by the character of this special sheet, and also that it may have followed the standard rule of being undersized.

Discussion.

James Christie: It is to be regretted that during the admirable experiments of Mr. Loss, on the flow of metal, especially in those relating to the resistance to punching and shearing, the element of time was not more accurately denoted.

It is obvious and well known that the resistance to flow or rupture of solid bodies is affected by the velocity of the movement. It has been asserted that if pressures exceeding the elastic limit were applied to material, through a punch, for example, and sufficient time allowed, perforation would ultimately follow. It is very well known that in the ordinary operation of testing by tension the velocity with which the pull is exerted exercises an important influence on the result, extremely low pulling speeds showing much lower tensile resistance than is indicated by higher speeds. Therefore, in order to discover exactly the comparative resistance to punching and to shearing, as touched on by Mr. Loss in his earlier paper, uniform velocities of movement should have been obtained as a necessary preliminary. The whole subject as presented by him has,

attention of the Institute, have been misunderstood. I have stated in my paper this evening that the "accepted power to punch steel is decidedly an unnecessarily large one," but have made no criticism regarding the truth or error of results previously found by other investigators in this field.

It is most decidedly the province and duty of the engineer to procure the best and most economic results with the least expenditure, and when it was demonstrated not merely in an experimental or laboratory way that practical punching machinery can be constructed upon certain principles which will allow them to perform 30 per cent. to 40 per cent. more work with the same expense the result is one which the engineer certainly ought to heed, and it is this particular aspect of the case to which I want to call the attention of my fellow members of the Institute.

Oil Tanks for the Beaumont Fields.—The Riter-Conley Mfg. Company of Pittsburgh, builders of iron and steel structural work of all kinds, have taken in the past two or three months some very heavy contracts for oil tanks for the new oil fields at Beaumont, Texas. The concern took a second contract the other day for one tank of 200,000 barrels capacity. These tanks will be built by the Riter-Conley Mfg. Company in Texas, the concern having about 200 men at work in shops at that place at the present time. This last contract will re-

quire about 4500 tons of steel plates, which will be furnished by the Pittsburgh mills. Some of the material will be worked up in the Pittsburgh and Allegheny shops of the Ritter-Conley Mfg. Company and then shipped to Texas to be completed. It will require fully 250 cars to ship all of the material from Pittsburgh to its destination. The J. M. Guffey Petroleum Company, the largest oil operators in the Texas field, have also placed orders for tankage with the Petroleum Iron Works Company, at Washington, Pa., for sufficient tankage for 375,000 barrels of oil. About 900 tons of plates will be required to build these tanks, all of which will be furnished by Pittsburgh mills. The J. M. Guffey Petroleum Company recently drilled in another well which is turning out about 500 barrels of oil per day.

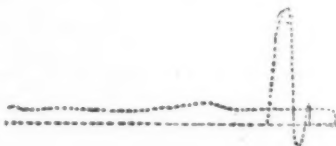
The Cambria Steel Company.

An official circular, under date of June 5, gives full particulars as to the reasons for the proposed readjustment and the method in which it will be effected. It states that the shareholders of record June 15 are entitled to subscribe for the new stock until July 15. The circular says in substance:

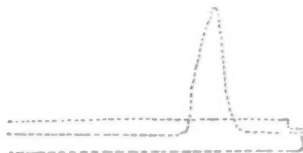
The revival of business and the consolidation of many of our competitors made it expedient to enlarge the scope of the company's operations. In so doing an indebtedness has been incurred to an amount exceeding \$3,500,000. To provide for its liquidation and to make the

The Cambria Steel Company will then be prepared to exchange the 320,000 full paid shares of the par value of \$16,000,000 for the 320,000 shares heretofore issued, upon which \$13.50 have been paid.

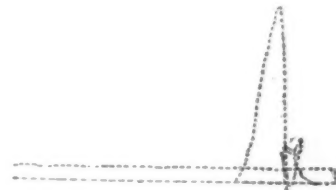
The Cambria Steel Company will enter into a contract with a syndicate to take and pay for at the price of \$22.50 the remaining shares of the Conemaugh Steel Company which may not be taken by the stockholders of the Cambria Company, but will offer these shares, to wit, 580,000 shares of the par value of \$29,000,000, upon which \$27.50 per share have been paid by the transfer of property, *pro rata* to the stockholders of the Cambria Steel Company upon the payment of a price equal to the balance due thereon, to wit, \$22.50 a share. Under this offer the holder of each ten shares of the Cambria Steel Company, after receiving ten shares of full paid stock in exchange for ten shares, \$13.50 paid, will be entitled to purchase 18 shares of the Conemaugh Steel Company, \$27.50 paid, at \$22.50 per share, receiving upon such payment the shares as full paid of the par value of \$50. Drexel & Co. will adjust fractions at the current market rate. Stockholders of record June 15, 12 m., have the privilege of taking said shares, such privilege to expire on July 15, 1901, and on or before the latter date must pay to Drexel & Co. \$2.50 per share, and on August 15 the balance (\$20) of the purchase price. Of the proceeds of this subscription \$11,680,000 will be appropriated to the needs of the business as above stated, and the balance will cover the commissions of Drexel & Co.,



Plate, 0.375 Inch; Punch, 0.937 Inch Diameter (Beveled); Four Holes.



Plate, 0.552 Inch; Punch, 0.937 Inch Diameter (Beveled); Three Holes.



Plate, 0.552 Inch; Punch, 0.937 Inch Diameter (Beveled); Four Holes.

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further enlargements and extensions needed to enable the company to manufacture the finished products at the lowest possible price requires an addition to capital account of \$11,680,000 (being a sum equal to the uncalled payments upon the capital stock), about as follows:

Payment of existing debt.....	\$3,500,000
Construction now undertaken.....	1,500,000
New furnaces, ovens, mills and water works.....	5,500,000
Additional working capital.....	1,180,000

While this additional capital could be raised by calls upon the stockholders, such course might be regarded as a hardship, and therefore provision has been made whereby stockholders who are prepared to respond to a call for such payment can do so, and those who are not so situated may retain their interest in the enterprise in full paid shares equal in number to their present holdings, with the privilege of selling the right to subscribe to the additional amount.

To this end it is proposed to organize a corporation under the laws of Pennsylvania with an authorized capital of \$50,000,000, in shares of \$50 each. Of this capital \$5,000,000 will be reserved and \$45,000,000 will be presently issued under a contract with a new corporation, to be known as the Conemaugh Steel Company, whereby in consideration of a transfer to them of the property and assets, including the lease with the Cambria Iron Company, the Conemaugh Steel Company will issue to the Cambria Steel Company \$16,000,000 in full paid shares and \$29,000,000 in shares, \$27.50 paid; said last named shares being subject to a further call of \$22.50 per share, which will be at once paid under this plan. A revaluation of the assets of the company shows full justification for a transfer of their property on this basis. The transfer will be subject to the payment, on June 25, 1901, to stockholders of record June 15 of a dividend of \$1.50 per share.

to wit, \$200,000, and the compensation of the underwriting syndicate, to wit, \$1,170,000. When the transaction, as thus outlined, has been completed, the property and assets of the Cambria Steel Company and the Conemaugh Steel Company will be merged and consolidated, and the business continued under the name of the Cambria Steel Company.

Nigrite Paint.—A. J. Tullock, engineer, in charge of the construction of Tampico Wharf, Tampico, Mexico, for the Mexican Government, has placed a large order for Nigrite paint with the manufacturers, the L. Z. Leiter Company, 81 Clark street, Chicago. It will be used for painting large steel caissons, which are to be submerged and filled with cement to support the wharf. The work to be done is quite extensive, several thousand gallons of paint being required. The salt water, the abundant animalculæ in the water, and the rapid formation of barnacles, all very injurious to unprotected steel, have made the selection of the proper paint to resist their action a difficult problem. Experiments were made covering quite a long period of time with many paints supposed to be the best calculated to endure a test of this character. The Nigrite Paint was selected as giving the best results. The L. Z. Leiter Company are greatly pleased with the selection of their paint under such circumstances.

The Monell Process.—The *Iron and Coal Trades Review* states that the Monell process has proved a success at the works of Bolckow, Vaughan & Co., Middlesbrough, on Cleveland iron, the experiments having been under way since March last under the direction of W. A. Bostwick of the Homestead Steel Works, John Evans of the Carrie furnaces, and David Evans, general manager of the company.

Opposition to Tariff Agitation and Reciprocity Treaties.

WASHINGTON, D. C., June 18, 1901.—The significant declarations recently made in influential quarters concerning the desirability of relaxing in some degree the measure of tariff protection now afforded leading American industries, and especially the very suggestive utterances of prominent manufacturers at the Detroit meeting of the National Manufacturers' Association concerning the reduction in rates on imported merchandise with a view to securing practical reciprocity, have aroused the liveliest interest among the majority leaders of the two Houses of Congress, with the result that a series of important conferences have been held here within the past week and a number of authorized statements have been prepared for publication. Almost without exception these statements have deprecated tariff agitation of any kind, and it is clearly evident that the majority leaders are organizing to prevent not only reductions in tariff, but the ratification of the pending reciprocity treaties which have recently been extended until the early summer of 1902.

Among those who have taken part in the conferences and who have given expression to their views concerning the tariff within the past few days are Senator Aldrich, chairman of the Senate Finance Committee; Senator Allison, who stands second on this committee; Representative Dalzell, the ranking member of the Ways and Means Committee, and who is accepted as the spokesman in the House for the iron and steel industry; Representatives Tawney and Grosvenor of the Ways and Means Committee, and Col. Albert Clarke, secretary of the Home Market Club and a prominent member of the Federal Industrial Commission.

Senator Aldrich visited Washington on the 15th inst. and conferred with several prominent Senators and a number of Department officials, discussing both the tariff and the pending reciprocity treaties. The fact that the Senate Finance Committee has been authorized to sit during the present Congressional recess has given an added significance to Senator Aldrich's movements here, and his outspoken declaration against any tariff revision is believed to voice the present sentiments of the majority members of the committee. Senator Aldrich does not hesitate to say that the pending reciprocity treaties should all be rejected, on the ground that they are negotiated on a wrong principle, providing as they do for concessions on certain lines of goods which are manufactured in the United States. It will be remembered that when the French reciprocity treaty was called up in the Senate during the last session it was finally abandoned by its friends because Senator Aldrich insisted that it should be referred to the Finance Committee, in order that calculations might be made as to the effect of its operation upon the customs revenues, a feature which had not been considered in detail by the Foreign Relations Committee.

Senator Allison, who is the ranking member of the Finance Committee, states that in his opinion the best interests of the country are opposed to any tariff discussion during the coming Congress, but referring to the free metal bill, he adds:

Senator Allison's Views.

"If this tariff matter comes before the Senate we will have to make a very careful investigation to see whether Mr. Babcock's plan will correct the evil which he seeks to remedy. I do not think it is a question to be settled offhand, but I also do not think that the tariff has as much to do with the trusts as Mr. Babcock supposes. The House must take the initiative in such matters, and if the House does not act the Senate will not be called upon even to consider the question."

Referring to the evidence given before the Industrial Commission to the effect that American iron and steel manufacturers have occasionally sold their products abroad at less than domestic prices, Mr. Allison says:

"I can understand that popular sentiment will indorse the proposition that American manufacturers should not

sell at lower prices abroad the products which they sell to the American people at a higher price. But this question is not a new one. Some years ago, upon the motion of Senator Vest, we had an investigation of this assertion. He quoted the prices at which agricultural implements were sold in Buenos Ayres to prove that the people of the Argentine Republic were getting those implements at a lower rate than the American farmers paid. We found that it was true that the wholesale dealer in Buenos Ayres did pay less for plows and harvesters than was charged in this country, but we also found that he had to bear the cost of distribution, so that by the time the machines passed through two or three hands and freight was paid the individual consumer paid as much as the American farmer. The manufacturers did nothing but ship the goods to Buenos Ayres, so that the expense was very light."

Representative Dalzell Talks.

Representative Dalzell of the Pittsburgh district of Pennsylvania is strongly opposed to any modification of the present tariff. On this point he says:

"I do not believe that it is a correct assumption that the Republican party is getting ready to change its policy on the tariff question. Believing, therefore, that the party is still where it has always been, I regard all of this talk in the newspapers as a tempest in a teapot, which will not materialize into an important movement. It will be easy enough to prove that a decrease of duties means lower wages for the workingman, and, this being the case, I cannot believe that a Republican Congress will deliberately deprive the workingman of a portion of his earnings. It will also be easy to prove that the abolition of tariff duties is not the way to strike at the trusts. According to my doctrine the tariff has nothing to do with trusts, but even taking Mr. Babcock's plan at his own estimation, I cannot see how he hurts the trusts. From my point of view he will play into their hands. The great steel trust cares nothing for the tariff, but if the tariff is abolished all the small competitors of the trust will go to the wall, because they cannot subsist if the tariff is removed. I could give instances from my personal knowledge where large combinations of manufacturers have asked that tariffs be not increased, because such action would result in the establishment of additional factories, and thus decrease their own sales and profits. When it is shown, therefore, that lower duties mean lower wages, and also the shutting down of small manufacturing, I cannot see how Mr. Babcock's plan will find any following whatever."

Mr. Dalzell defines his position on the subject of the pending reciprocity treaties with considerable emphasis. In an authorized statement made to the correspondent of *The Iron Age*, he says:

"Without attempting to go deeply into so broad a subject, it seems to me that the true principle of reciprocity is described in the declaration of the Republican platform upon the subject adopted just a year ago, to the effect that 'We favor the associate policy of reciprocity so directed as to open our markets on favorable terms for what we do not ourselves produce in return for free foreign market.'

"On no other basis does the policy of commercial reciprocity seem to me to be consistent with the protective principle on which our present tariff law is based. It is perhaps significant that the language employed in the platform of 1900 recognized a progressive public opinion on the subject of reciprocity, for the qualifying clause 'for what we do not ourselves produce' was emphasized, and might be said to be the keynote of that particular plank.

"I cannot reconcile the idea of the application of the protective tariff carefully gauged to meet the actual needs of our industries with any plan of cutting down that protection for the sake of inducing other nations to buy certain of our products. Take tin plate as an illustration. Owing to the high scale of wages paid in the United States, as compared with those current in Wales, the tin plate industry would never have been established in the United States, and could not exist today, but for the protective tariff. Would it not be wholly

irrational, however, for us to offer the people of Wales, for example, a reduction in the protection on tin plate in consideration of their purchasing from us other articles of American produce? The protection afforded this industry by the Dingley act was no more than it needed; why, then, should it be crippled in the hope of strengthening some other American industry by enlarging the foreign demand for its products?

"There is a very wide range of products which we must import at least for many years to come, and which do not come into competition with domestic products. The true principle of reciprocity would permit the granting of concessions from our tariff rates on such products, and in return we would probably be enabled to secure such reduction in the foreign tariff upon our own surplus products as would enable us to market them upon a basis of fair profit, thereby materially reducing the cost of production and lowering prices to the domestic consumer."

Representative Tawney's Opposition.

Representative Tawney of the Ways and Means Committee, who speaks for a constituency not far removed from that of Mr. Babcock, is opposed to tariff legislation, although he thinks an effort will be made to place restrictions upon the operation of the so-called trusts. On this point he says:

"I do not believe that the next session of Congress will enter upon a wholesale revision of the tariff, but there is undoubtedly a growing sentiment in the West against trusts, and especially those trusts which sell their products to the American people at a higher figure than they sell the same goods abroad. It is quite possible that this phase of the trust question will engage the attention of Congress. There is a good deal to be said on both sides of the question, and the discussion will be interesting, even if it does not have any result. I should not be surprised, also, if there is an effort to enact legislation that will restrict the combinations that have been formed in restraint of trade. There is certainly a widespread feeling in the West upon this subject."

The Home Market Club.

The leading members of the Home Market Club of Boston are taking an active part in the work of developing public sentiment against tariff revision, and especially against the serious consideration of the Babcock bill. Their views are reflected in the following authorized statement made by Col. Albert Clarke, secretary of the club:

"I assume that Mr. Babcock desires to strike at whatever evils are found, and without doubt there is considerable sympathy with his purpose in all parts of the country. I see that Senator Harris of Kansas indorses the measure or its purposes, and says it finds favor with most of the people in his section. Of course their motives and opinions are to be respected, but I think when Senator Harris says that manufacturers must be prevented from selling at lower prices in foreign countries than at home he will have to study the subject profoundly to find a preventive in the Babcock bill or in any other proposed legislation. The fact is, most exporters in all countries have sold abroad at lower prices than at home, and have done so since exportation began. Nearly 50 years ago a commission of the British Parliament reported that it was the common practice in that country. I do not know how any man can be prevented from selling his goods for whatever he can get for them, wherever he chooses to take them.

"The assumption of the Babcock bill is that the steel trust, so called, is not only an evil, but a result of the tariff. Now everybody recognizes that it is in no other sense the result of protection than that the industries which it carries on may have been established in this country under the inducement of a protective tariff. But there are many other concerns engaged in these industries besides the United States Steel Corporation. They are independent and competing. One of the objects of protection is to develop competition among home industries. Now, if protection is withdrawn, the smaller and independent companies will be more injured by it than the combination. This is so plain a proposition that it

does not need to be fortified by fact or argument. Therefore Mr. Babcock's bill would defeat one of its purposes, and I have yet to find the man who can see how it would protect consumers of iron and steel goods in this country or compel those of any other country to pay any more than they pay now.

"A protective tariff should be equitable and national, extending alike to all industries that are subject to foreign competition. To amend it piecemeal is to introduce inequality and injustice. There is absolutely nothing to defend or justify it from a protectionist or Republican point of view. If the combination were certainly an evil, and if that evil could be remedied by amending the tariff, all of us would be ready to agree upon a reasonable proposition, but the whole scheme seems to be a thoughtless impulse, and I do not believe that it will find favor in either house of Congress among those whose special function it is to study tariffs and their effects."

Nearly all the majority leaders who have visited Washington have called upon the President and have urged him to give no countenance to the tariff revision movement, and have expressed the hope that he would not deem it advisable to recommend to Congress either action on the tariff or the ratification of the pending reciprocity treaties. The President has refrained from committing himself on either point and has given no assurances as to his future course.

W. L. C.

The Dominion Iron & Steel Company.

The annual meeting of the Dominion Iron & Steel Company was held in Montreal last week. H. M. Whitney, the president, announced that owing to the accident that had befallen Mr. Moxham's son, the general manager's report had been delayed, and that the auditors' statement was all they had to present. Mr. Whitney said that the company had two furnaces in operation, and were shipping all over Canada, as well as to the United States and Great Britain. Mr. Moxham would probably be able to tell them in his report that two reserve furnaces would be ready in July, and that steel furnaces would be ready by September.

The election of directors then took place, resulting as follows: Sir W. C. Van Horne, R. B. Angus, James Ross, Hon. George A. Cox, Elias Rogers, Hon. Robt. Mackay, H. F. Dimock, A. H. Paget, Hon. David Mac-keen, W. B. Ross, B. F. Pearson, J. S. McLennan, A. J. Moxham, H. M. Whitney, F. S. Pearson.

At a subsequent meeting H. M. Whitney was re-elected president and A. J. Moxham vice-president and general manager. It was decided to adjourn the meeting till June 26, when Mr. Moxham's report will be presented.

Following is the auditors' report:

Bonded indebtedness.....	\$8,000,000.00
Preferred stock.....	5,000,000.00
Common stock.....	15,000,000.00
Bills payable.....	90,808.77
Accounts payable.....	545,848.25
Total.....	\$28,636,657.02
Property account.....	\$14,551,480.00
Plant account.....	9,668,406.42
Interest on bonds.....	232,522.32
Expenses, preferred stock.....	22,711.13
Construction material on hand.....	241,014.89
Warehouse material.....	64,500.75
Bell Island (winter work).....	96,440.26
Freight and advances to vessels.....	117,075.51
Operating suspension.....	76,747.06
Undistributed accounts, Marble Mountain, coke ovens, foundry and railroad.....	63,898.12
Warehouse suspension.....	32,854.74
Manufacturing supplies.....	530,553.75
Bills receivable.....	27,431.66
Prospecting.....	6,093.25
Freight undistributed.....	14,527.53
Sundry small expense items.....	3,548.87
Accounts receivable.....	225,431.73
Bell Island (sales).....	19,986.32
Due from preferred stock.....	1,435,849.20
Cash on hand and in banks.....	1,205,583.51
Total.....	\$28,636,657.02

The Buffalo Roll & Forge Company.—At Buffalo, N. Y., the Buffalo Roll & Forge Company have been organized by John S. Kellner, president; Archibald Mc-

Kaig, vice-president; John Reilly, secretary; John McKaig, treasurer, and Daniel J. Boyle, superintendent, to build mill machinery and do roll grinding and corrugating as a specialty. The plant, which is at 161 to 165 Church street, will be equipped to do all kinds of drop forging and die sinking and to make and repair special machinery. The persons connected with the new company have been in the business for many years.

John G. Sadlier.

PRESIDENT OF THE AMERICAN FOUNDRYMEN'S ASSOCIATION.

John G. Sadlier, who was elected president of the American Foundrymen's Association at the recent Buffalo convention, is vice-president and general manager of the Springfield Foundry Company of Springfield, Ohio. He also bears similar relationship to the Fairbanks Machine Tool Company. He was born at Johnstown, Pa., in 1856, and at the age of 12 entered the foundry of the Cambria Iron Company as an apprentice. Shortly



J. G. SADLIER.

President of the American Foundrymen's Association.

after he had served his time at the Cambria foundry he entered the employ of the Morgan Engineering Company of Alliance, Ohio, and was made foreman of the foundry. Later he became foreman of the foundries of the Walker Mfg. Company of Cleveland, William Tod Company of Youngstown and the Sharon Steel Company. He then became a member of the Springfield Foundry Company, assuming charge of the entire plant. He has always taken an enthusiastic interest in the papers and discussions at the meetings of the American Foundrymen's Association, having been a member since its organization. His paper on "The Problem of the Molder," as presented at the Buffalo convention, shows that he has the welfare and progress of the molder at heart, having himself risen from the ranks.

At Pittsburgh, the Carnegie Steel Company have filed the following answer to the bill in equity of William W. Blackburn against Andrew M. Moreland and that company to secure possession of 2376 shares of stock of that corporation, held by Moreland as trustee: "The Carnegie Company, one of the above named de-

fendants, for answer to the bill of complaint of said W. W. Blackburn, trustee, say the statements in fact contained in said bill are true as therein alleged."

Notes from Great Britain.

Offices of *The Iron Age*, HASTINGS HOUSE, 1 NORFOLK STREET, STRAND, LONDON, W. C., June 8, 1901.

A Corporation Contract.

The Manchester Corporation have accepted a tender from Babcock & Wilcox for 24 boilers, each capable of evaporating 12,000 pounds of water per hour, for the Stuart Street Tramway Works. Babcock & Wilcox have now received altogether orders amounting to 39 boilers from the Manchester Corporation, the aggregate evaporating capacity of all the boilers being equal to 530,000 pounds of water per hour. In my next dispatch I propose briefly to review the present position of corporation contracts and the difficulties in connection therewith.

London Electric Traction.

The most striking feature of the past week has been the public announcement made by the chairman of the Metropolitan District Railway Company that Charles Yerkes' proposals for the electrification and equipment for working the line by electric power have been accepted. The Yerkes combination agree to take \$2,500,000 worth of ordinary stock at the nominal price of 25 per cent, and \$830,000 worth of debenture stock at par, and in virtue of this agreement they undertake the obligation of the conversion of the line. They further undertake to carry out the change without any interference with the working of the traffic. This is described by the chairman of the Metropolitan Company as "astonishing assertion of confidence." Certainly Londoners will be delighted that at length the underground railway will be worked by electric power. Those who have had painful experience of the sulphurous condition of the line as it is now will rejoice exceedingly. The solicitor to the line emphatically states that the American company will not make a penny of profit either on the erection of the power house or on the supply of the materials for the electrification of the railway. Those supplying the money required to carry out the proposed changes look to the future increment in the value of their stock for their remuneration.

American Engines in Glasgow.

The general manager of the Glasgow Electric Tramways is experiencing considerable delay in working the Allis engines which have been put down. The defects are chiefly in connection with the oiling arrangements, but none of them appears at present to be of a serious nature. The chief expert of the Allis Company arrived on May 16, and has since taken the overhauling of the engines in hand, with the result that No. 1 engine was soon started and run on a quarter load. Further adjustments were deemed desirable, and these being done, the engine has since been working on full water load. The one Allis engine can operate 200 cars or more, and it is proposed to keep the other in reserve.

A Tin Plate Strike.

Owing to a dispute with about a dozen workmen at the Upper Forest & Worcester Steel & Tin Plate Works, Morriston, South Wales, the whole concern, employing 200 hands and paying \$40,000 a month in wages, have stopped work. This will have a further serious adverse influence upon the South Wales tin plate trade.

An Attempted Zinc Combine.

The Continental zinc producers have recently held another conference at Berlin, to try and start a new syndicate for controlling output and prices. An agreement was not reached, however, the interests of the concern being somewhat divergent. A committee, composed of three members representing Silesia, North Germany and Belgium, has been appointed to examine into the situation and try and arrive at some harmony, with the view eventually of forming a practical combination. Zinc users will watch the result with some interest.

S. G. H.

The Foundry, Its Equipment and Management.*

BY EDWIN B. GILMOUR, MILWAUKEE, WIS.

In the first place we will consider what a modern and up to date foundry should be when quantity and quick deliveries together are of greatest importance. The foundry should be built so as to have easy access to all other departments, especially the pattern shop and machine shop; it should be in a position to receive the greatest amount of light and air in order to dispel all of the obnoxious gases generated while casting; there should also be the greatest amount of comfort possible for the men employed therein, because in winter time, when it is excessively cold, you cannot get full value from the men when they do not feel comfortable, and in summer time, when it is extremely hot, if your place is not well ventilated, the men will very often walk home after the company has been at the expense to get up steam to run the plant.

Author's Plans.

The accompanying sketch, Fig. 1, will give an idea of what I have designed and submit for your discussion. You will observe that I have adopted a system of building which may be called the "bay" system. A building of this description can only be used to advantage in a very large plant, or where a plant is put up with the expectation of enlarging from time to time. The main feature of this plan is to concentrate important operations as near to the center as possible, as a very long, narrow foundry may be a source of trouble by causing many delays, because one crane cannot pass on account of another being in use at some inconvenient place. It is desirable to have a crane equipped with double trolleys, the reason being obvious, for when there is a very heavy piece to make it is not practicable to put all the metal into one ladle, as this might be too heavy a load for one point on the crane, whereas if the crane has double trolleys a ladle can be suspended on each hook, which will amount to having two cranes. I have often seen three cranes used to pour a large piece, four ladles being used, one of the cranes taking two ladles (when one was emptied it had to be dropped down and another which was in readiness picked up). If the cranes had double trolleys they would have only used two cranes and done the work more expeditiously, thereby leaving the third crane free to take the iron away from the cupola and cause no inconvenience. In taking out heavy castings both hooks can be attached to a piece exactly as if two cranes had been employed. In the case of large molds, where two cranes are required (such as very large fly wheel molds), they can be lifted in the same manner. If at any time one of the motors should burn out you can hoist the block right up and run it out of the way, and use the other trolley until there is time to have repairs made, thereby avoiding the loss of time by having men waiting until the crane is in readiness again. In many cases where two cranes are used to roll over heavy molds, one crane with two trolleys will serve the purpose just as well and save the inconvenience of keeping one crane waiting for the other.

At the end of the shop there should be placed stationary spindles for loam work. A wall crane is provided between every two spindles in order to lift them as well as other light plates out and in as desired, so that there will be no waiting for the large crane. These wall cranes can be rigged with a chain and Yale & Towne block of 1500 pounds capacity, and can be operated by hand or electric power. When the spindles are out of use they can be suspended to a short chain attached to the pillars, and the arms can be pulled up against the wall, well out of the way. The drying ovens are placed in the side wings, three at each side (or as many as may be desired); the tracks are run clear across the shop, so that a mold can be put under any of the cranes, so that all three of them can be used in connection with the same oven track at the same time if required. The cars are run out in the ovens with an endless link-belt

chain, a loose chain being hitched to the car with an S hook, which can be attached to any link of the chain. Near the center of the shop are the cupolas, which are set up pretty high in order that an 8 or 9 ton ladle can be placed upon a truck and run underneath the spout. When filled it may be transferred under any of the cranes, or it can be side tracked and another ladle set under. The end of the shop is reserved for the cleaning of all castings, and a railroad spur put in far enough to load and unload trucks with each crane. The tumbling barrels are placed in line with the sand sheds, so that the noise and dust may be kept outside of the foundry. Double emery wheels are placed in the side wing, and benches provided with vises are installed in order to chip the small castings. On one of the tracks there can

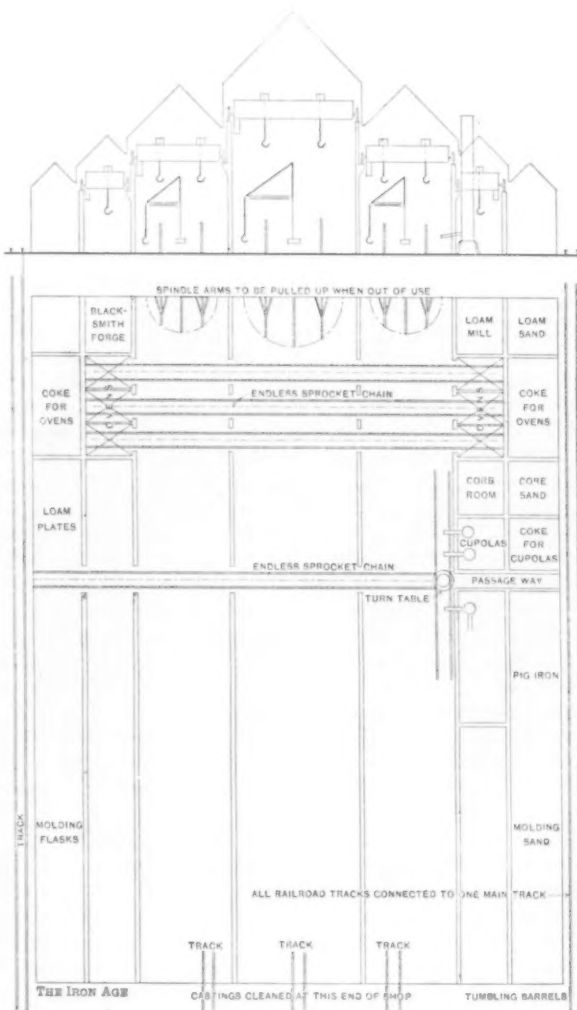


Fig. 1.—Plan Proposed by Author.

THE FOUNDRY, ITS EQUIPMENT AND MANAGEMENT.

be placed a track scale large enough to weigh a regular flat car. All castings should be marked with the weight and date of making, and a record kept which can be referred to at any time in order to know the exact mixture of the metal used in them.

Attached to the foundry there should be a chemical laboratory, also equipped with a complete set of testing machines, in order to make all the required mechanical and chemical tests. I am of the opinion that both are essential in all well regulated foundries. I also believe that it is necessary for a foreman in the foundry to be possessed of some chemical knowledge on the mixture of metals and other materials used in the foundry. This knowledge can be easily acquired by any one who is desirous to receive the information, and I predict that in the future it will become one of the indispensable qualifications of any one who wishes to become a foundry foreman.

* Abstract of paper read at American Foundrymen's Association, Buffalo Convention.

Along each side of the foundry is a railroad siding intended to distribute the coke to the ovens and the cupolas. The sand and other materials required in the foundry are placed in sheds built against the foundry wall, which serve to keep out the frost in winter time.

Cupolas.

The cupolas should be provided with a regular system of trolley tracks and suspended trucks running from

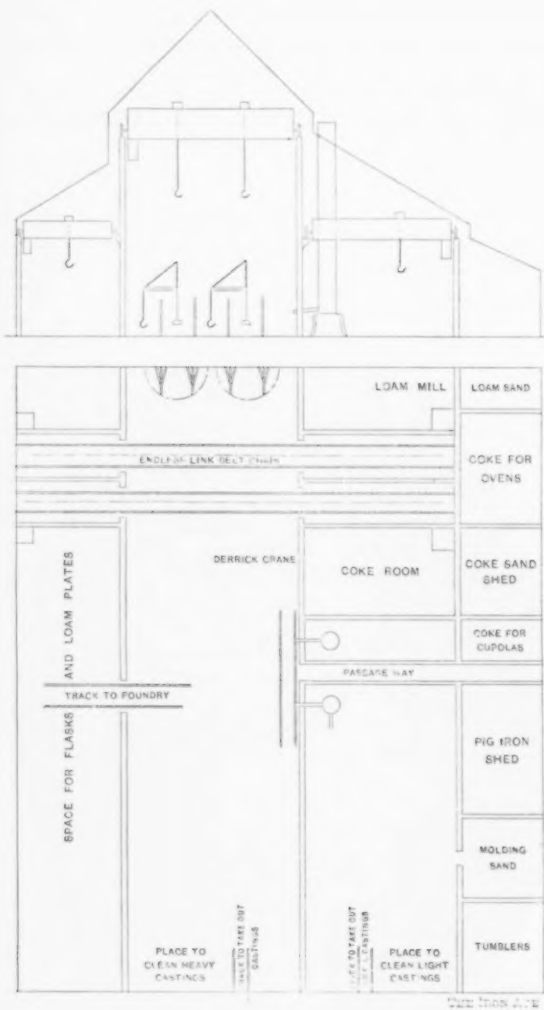


Fig. 2.—Second Plan.

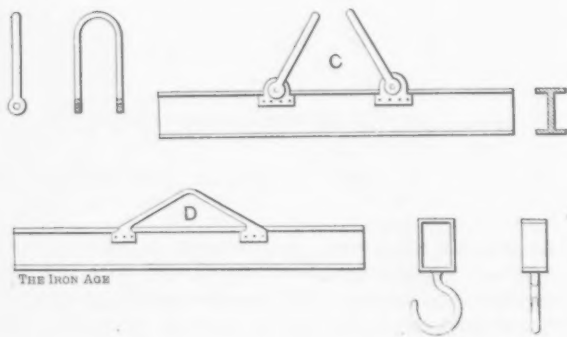


Fig. 3.—Beams for Lifting Molds.

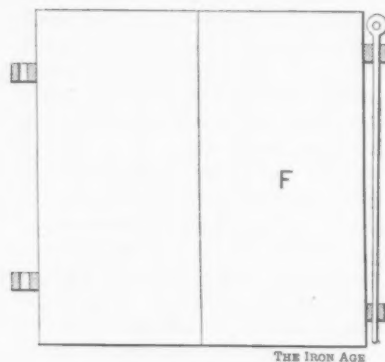


Fig. 4.—Plate for Curbing.

raised and lowered upon the scale by means of a long lever suspended from the trolley. In close proximity to the scale there should be a blackboard with each day's heat properly recorded, having columns itemizing the mixture of each charge, and these charges should go in their regular order so as to prevent confusion. The order of the charges should be made out by the foreman each day and a correct entry recorded in a book provided for the purpose. With reference to the cupola there are so many designs in the market that show special advantages, and there have been so many able articles written upon this subject, that it would be out of place for me, at this time, to revert to this subject in particular. In the August, 1900, issue of the *Foundry* I published an article upon the cupola, which was specially reviewed for the members of this association by our secretary. In connection with the cupola there should be installed a device which costs practically nothing to operate—the magnetic separator. A device of this kind is essential in a well equipped foundry where economy is studied, and I prefer the Dings separator, which is made in Milwaukee, for my own work.

Second Plan.

Fig. 2 is the plan of a foundry of smaller dimensions and more suited to fill the requirements of the average foundry at the present time. The main feature of this building is the presence of only two bays, one large and one small one, so that all of the small work is kept together, the benefits of which will be readily seen by the interested observer. The description already given of the large plant will suffice for the smaller one, as they are built practically upon the same lines.

Equipment.

Of the numerous subjects brought under discussion among foundrymen there are none more important than equipment and management. These are so closely allied that the success or failure of a foundry is determined by a proper understanding of them. There are no subjects which have been more discussed; yet withal the information is as much needed to-day as ever. In reviewing the history of the iron foundry there has not been so fruitful a change as one might have expected. The foundry has not made the great advances that science and the arts have made; indeed, I consider that among the various appliances of mechanics the founder has the greatest need of incessant study. In every country and every locality that the foundryman has entered he is confronted continuously with new difficulties. In some sections of this country he has material which is suited in every respect to his requirements, consequently

THE FOUNDRY, ITS EQUIPMENT AND MANAGEMENT.

the pig iron sheds direct to the elevator, and from the elevator to the charging door of the cupola; each truck should hold a complete charge for the cupola. There should be a liberal supply of trolley trucks in order to save handling the iron too often. When these trucks are emptied they can be returned by the return track to be refilled. A scale can be arranged in connection with the trolleys to weigh the charges. The trucks can be

he has unbounded success in his work, while in other localities he is obliged to use materials which are unsuited to his business requirements; he has, therefore, to mix his materials in order to get the desired results. In general engineering there are certain rules to go by, which are the same the world over; the same applies to the draftsman, the pattern maker, the blacksmith and all other mechanical lines. The workmen can also see the

progress of their labors, whereas the molder is never sure of his work even after an engine built with it is working, because the castings may have some very severe contraction strains in them which are unknown until one of them unexpectedly gives way and surprises every one.

In equipping a foundry the manager should always be open to conviction and get the best tools which may be procured for the purpose at the lowest possible cost. In some large foundries it is customary to use a cross to lift heavy molds. Attached to this tool are heavy slings, which are made in many different styles. Some are simply huge links, and when these are used it is necessary to have a large assortment in order to suit the various requirements. Again some foundries have slings made in a most ingenious manner, and which can be extended to any length, and serve the purpose admirably. The most improved method of lifting heavy molds, however, is with a steel beam, best made of an I section and suspended at the center. A double shackle or clevis, with a loose hook on each end, which slips out and in on the beam to suit the requirements, will be seen in Fig. 3 at C. The reason for using double shackles is that with an uneven load the beam is suspended directly with each half independent upon the hook of the crane, whereas if you only use the single bar, as in D, at the least swing of the crane the load will roll in the hook and you run the risk of upsetting the mold which may be suspended. Chains of ample strength are suspended from these hooks, which are lengthened at will to suit the requirements. This is by far the most expeditious method of lifting heavy molds. The chains are more flexible and are light to handle, and the device takes up very little room when not in use. A good rule to go by in making these chain hooks is to double the size of the chain; thus for $\frac{3}{4}$ -inch chain used $1\frac{1}{2}$ -inch square iron bent over the diagonal section.

For the purpose of curbing some founders use sheet iron plates about 72 x 30 inches, with a row of holes at each end in order to bolt them together. This is a very crude and slow method. Other founders use a cast plate made with lugs on the ends, so as to allow a pin to join the plates together. This plate, I believe, has been patented, and is made in various sizes to suit the requirements. Being of cast iron, they are very heavy to handle, but are very good. In my opinion the best and most practical plate for curbing purposes is simply to take a steel plate 3-16 inch thick, as is represented in Fig. 4. These plates are made 27 inches high and of various widths, to suit the circumstances, such as 36 inches, 24 inches, 18 inches, and 6 inches. For making runners it is advisable to have them 14 x 14 inches. These plates are very light, are easily transported from place to place and take up very little room in stacking up out of the way.

For binding or fixing molds together bolts are the best. They can be made in various lengths, also lengthened to suit the requirements by using reverse hooks linked in a triangle or sling, which is put over the lower handles. These hooks should be made 6 inches, 12 inches, 24 inches, 36 inches, and so on, in any length as desired, and should be made of no less size of iron than $1\frac{1}{4}$ inches.

In the green sand shop there should be a plentiful supply of gagers and an abundance of clamps and a place to put them. For all standard patterns there should be flasks for the purpose, with follow boards. All flasks which are too heavy for hand lifting can have trunnions bolted on the sides, so that they can be rolled over without lowering down; unless when too large, as they are then apt to spring a little. I have rolled very heavy flasks with trunnions, however.

Management.

In this age of economy it is not practical to have molders do work which can easily be done by the helper. All flasks should be fitted to the pattern before being brought to the molder, all facing sands should be mixed and sifted by a power sieve and brought to the molder. The iron for casting should be carried by large ladles or conveyors, so as to be handled quickly and cheaply.

The castings should be taken off the floor at night, and the sand watered and cut up ready for use when the molder comes to work in the morning. The same rule applies to the loam shop, as molders are better satisfied to do only molding work. It is a good practice to have two men follow the crane and lift all work under the guidance of the molder making the piece. These two men will endeavor to locate all work in such a way that it will be for the general good. The manager should have complete control of his men. He should not become too familiar, as familiarity breeds contempt. He ought to be a good mechanic and competent to give advice whenever it is required, and not afraid to assume responsibility. Whenever orders are given they should be definite and decisive, because when orders come from one in command which are not decisive the men who receive them become careless and pay little attention. To a man possessing the requisite qualifications to become a competent manager a liberal salary should be given, because the success or failure of the company is determined by a proper knowledge of the business being intrusted to him, even if the company have unlimited capital.

In the management of the foundry there is nothing of more importance than to have a correct accounting of all that transpires. This can only be accomplished by a regular system of bookkeeping, so that the foundryman can intelligently estimate on whatever contracts may be upon the market. There should be a storeroom for the foundry, and all materials should be checked by the storekeeper, who should also be supplied with a regular set of books for recording everything. There should be a proper place for everything, so that he can hand out the goods as quickly as possible, and not have men lounging around the window. Whenever supplies are given out, he must record them against the job and the individual, and when the person knows that everything is recorded against him he will be very careful not to be wasteful. This storekeeper can also check up all castings which are delivered to the different departments, and in return take a material slip properly signed by the party receiving such castings. At the end of each month these books are balanced, and the cost per pound of every casting noted. An average cost of all castings should also be made, so that the foreman can instantly know how the foundry is doing, and if there should be any discrepancy he will know just where to locate the trouble.

The Naxos Emery Depot.—The British Consul at Syra reports that the establishment of the Naxos Emery Depot at that port in 1899 by the International Control Committee has been attended with success, to the great satisfaction of both the Government and the shippers of Naxos emery, the price of which remains the same—viz., \$20.25 per metric ton, including the tax of \$1 per ton levied by the Government. The total amount exported in 1900 was 6023 tons, valued at \$130,000, an increase of 884 tons over 1899. This excess is alleged to be due to the facility in the shipping operations at Syra, whereas formerly in Naxos itself the difficulties experienced by the shippers in dealing with the emery laborers, and the danger incurred by the steamers loading in an open roadstead were very great. The quality of the mineral is now far better than it was formerly, although the price is the same, as it arrives in Syra specially selected for exportation, and does not contain the residue of the small stones and rubbish which used to be indiscriminately shipped at Naxos without heed or method. The trade in this article promises to flourish, as over 3000 tons were exported in the first three months of this year, and several large orders are in hand. The amount dealt with in 1900 was distributed as follows: 1760 tons to Hamburg, 1670 tons to Liverpool, 1380 tons to Rotterdam, 1000 tons to Boston and the remainder to Odessa.

Geo. G. Blackwell, Sons & Co., of The Albany, Liverpool, who make a specialty of manganese, chrome ores, bauxite, barytes, magnesite and molybdenite, have opened an office in London, England, at 6 and 7 Cross lane, Eastcheap, E. C.

Machine Cast Foundry Pig Iron.

BY ALBERT LADD COLBY, SOUTH BETHLEHEM, PA.

The advantages of machine cast pig iron for basic open hearth use are now universally recognized, and it has also, very properly, become the practice to cast Bessemer pig iron in iron molds. The majority of pig iron consumed by puddle mills is still sand cast, but this is principally because isolated blast furnaces running on mill iron have not yet added a casting machine to their plants. The same advantages in machine cast iron—namely, freedom from sand, with its consequent cleaner metal; absence from foreign siliceous matter, alumina, &c.—apply to the puddling process as to the basic or acid open hearth process, or to the cupola melting in Bessemer practice.

But few producers of foundry pig iron have as yet ventured to oppose the still current practice of purchasing foundry pig iron by appearance of fracture, and offer to the foundryman a machine cast iron. Among the pioneers in this progressive movement are the Bethlehem Steel Company, with whom the writer is connected. We met, as expected, the prejudice in the appearance of the fracture of our machine cast foundry pig iron, a prejudice which could not, in some quarters, be entirely removed by showing that the iron contained, say, 3 per cent. of silicon and 3.50 per cent. total carbon.

In studying the requirements of the trade we met some foundrymen who, realizing that the different makes of No. 1 foundry pig iron vary widely in their percentage of combined carbon and wishing a very uniform foundry iron for a very important class of castings, had issued specifications in which the percentage of combined carbon is limited. One such specification is as follows:

	Per cent.
Combined carbon, not over.....	0.40
Silicon	2.25-2.75
Phosphorus	0.50-0.90
Manganese, not over.....	0.80
Sulphur, not over.....	0.04

The writer's company offered to the customer originating this specification a machine cast foundry pig iron meeting the above chemical specifications, except, of course, the combined carbon, and it was represented to the customer that although the chilling of our iron during the operation of machine casting had converted a larger proportion of the carbon into combined carbon than if the same iron had been cast in sand, that as easily machined a casting could be produced by remelting our machine cast iron, containing about 1 per cent. of combined carbon, as by remelting a sand cast iron containing the percentage of combined carbon specified—namely, not over 0.40 per cent.

The following experiment was immediately undertaken to prove the truth of the above assertion. This experiment was cited by the writer during a discussion on "Grading Pig Iron by Analysis" at the annual convention of the American Foundrymen's Association held in Buffalo June 4-6.

We had at the time one of our blast furnaces on foundry iron of about 3 per cent. silicon. Arrangements were made for casting one-half of a cast of this foundry iron in sand and the other half was taken in ladles to our casting machine. Equal quantities of drillings from six pigs, selected from different parts of the portion of the cast which had been cast in sand, were taken, and similar drillings were obtained from the portion of the cast which had been taken to the casting machine, and each was carefully analyzed, with the following results:

Cast No. 7602.	Sand cast.	Machine cast.
Silicon, per cent.....	3.00	2.99
Manganese, per cent.....	0.95	0.95
Phosphorus, per cent.....	0.770	0.773
Sulphur, per cent.....	0.041	0.041
Total carbon, per cent.....	3.460	3.380
Combined carbon, per cent.....	0.250	0.920
Graphitic carbon, per cent.....	3.210	2.460
Tensile strength, pounds per square inch.	15,000	41,000

The high tensile strength of the machine cast iron is due entirely to the higher percentage of its combined carbon.

Some of the sand cast portion of this cast and some of the machine cast portion were melted separately in the same cupola, keeping all smelting conditions as nearly uniform as possible, and castings from each melt were made which proved by analysis, tensile strength, ability to machine and appearance of fracture to be as nearly alike as different things made from the same iron ever are. The following report on the test ingots, cast with the experimental castings, supports this statement:

	Sand cast pig iron.— Ingot 3½ inches square and 1½ feet long.		Machine cast pig iron.— Ingot 3½ inches square and 1½ feet long.	
	Cast horizontally.	Cast vertically.	Cast horizontally.	Cast vertically.
Silicon, per cent....	2.93	2.91	2.96	2.95
Manganese, per cent.	0.84	0.85	0.84	0.84
Phosphorus, per cent.	0.766	0.769	0.772	0.764
Sulphur, per cent...	0.071	0.064	0.077	0.071
Total carbon, per cent.	3.400	3.390	3.364	3.357
Combined carbon, per cent.	0.470	0.368	0.336	0.257
Graphitic carbon, per cent.	2.930	3.022	3.028	3.100
Tensile strength, pounds per square inch	18,000	16,300	17,000	17,000

The accompanying plate reproduces photographs of the machine cast and the sand cast pig iron, and the fractures of the machine cast and sand cast ingots.

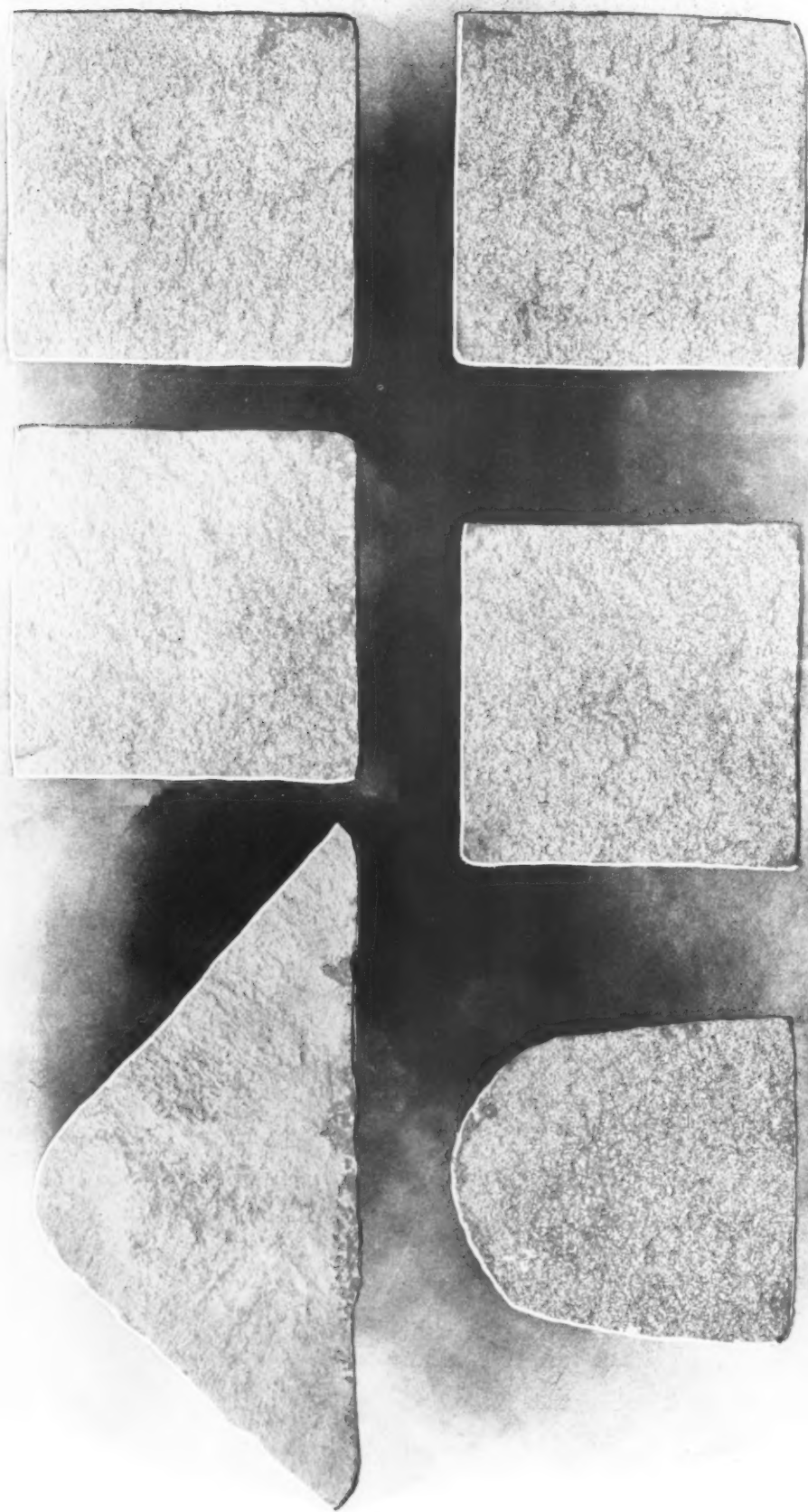
The total difference in the appearance of the fracture of the machine cast and sand cast portion of the cast of foundry pig iron is shown in the accompanying photograph, and the similarity of the fracture of the ingots cast horizontally and vertically by remelting each kind of iron separately forms the strongest sort of ocular demonstration of the fallacy of purchasing foundry pig iron by the present method of grading by fracture, and should persuade the practical foundryman to avail himself of the many advantages of a machine cast pig iron.

The Wabash Railroad in Pittsburgh.—It is expected that in a short time contracts will be let for the building of a portion of the roadbed which is to give the Wabash Railroad an entrance into Pittsburgh. Included in this work will be the building of a steel bridge across the Monongahela River at Ferry street, and the construction of 12 miles of railway beyond Bridgeville, Pa. The two contracts, which are said to amount to about \$3,000,000, are to be placed before June 30, the stipulation being that the section must be completed by November 1, 1902. The bridge to be constructed across the Monongahela River will be of the cantilever type, and will require about 8000 tons of steel. It will be double tracked, will have a center span of 830 feet from center to center of piers, with 785 feet clearance. This bridge will be 85 feet above the pool level of the Monongahela River. It will have the longest span of any railroad bridge in the country.

An Indiana Coal Mines Consolidation.—The owners of coal mines in Indiana are at work on a scheme to consolidate all the coal mining interests of that State. The plan is being worked out by Chicago capitalists, who propose to organize a company with \$15,000,000 capital for this purpose. It is proposed to take in hand the consolidation of the Illinois coal mining interests as soon as the Indiana scheme has been successfully accomplished.

Wm. H. Thompson, formerly treasurer of the Illinois Steel Company, has opened an office in room 470, The Rookery, Chicago. He will negotiate commercial paper, and will also act as sales agent for manufacturers of machinery, fire brick and other products having connection with the iron and steel trade. Mr. Thompson enjoys a wide acquaintance in iron and railroad circles, and the agencies which he has already secured give promise of developing an extensive business.

President Hays of the Southern Pacific Railroad Company has given orders to have all of the company's locomotives equipped with oil burners. It is said that by the use of oil for fuel instead of coal the company can save nearly \$5,000,000 a year in operating expenses.



MACHINE CAST FIG.
SAND CAST FIG.

"MACHINE." CAST HORIZONTALLY.
"SAND." CAST HORIZONTALLY.

"MACHINE." CAST VERTICALLY.
"SAND." CAST HORIZONTALLY.

FRACTURES OF MACHINE CAST AND SAND CAST FOUNDRY PIG IRON.

A Record Production of Coal.

Official reports show that the year 1900 closed the century with the largest coal production ever recorded in the United States, and continued the supremacy of the United States among the coal producing countries of the world. Practically complete returns sent to Edward W. Parker, statistician of the United States Geological Survey, show the total output of coal in 1900 to have been 267,542,444 short tons, an increase over the preceding year of 13,802,452 tons, or a little more than 5 per cent.

The value of the product was \$297,920,000, an increase of 16 per cent. over 1899. Coal producers felt a much greater benefit from the improved trade conditions in 1900 than in either 1898 or 1899. Coal contracts are usually made a long time ahead, sometimes more than a year, and much coal was delivered in 1899 at less than it cost to produce it, the price of labor having advanced before the operators could advance the price of coal. The value of the coal product in 1900 was equal to nearly one-third of the value of the total mineral product of the United States in 1899.

Maryland, Oregon and Idaho were the only States whose coal product in 1900 was less than that of 1899. Owing to the strike in the anthracite region of Pennsylvania in the autumn of 1900 the production of anthracite coal decreased about 3,000,000 long tons, the product in 1900 being 50,988,982 long tons, against 53,944,647 long tons in 1899.

This decrease was more than made up for by an increase of nearly 5,500,000 short tons (about 4,900,000 long tons), in the output of bituminous coal in the State. The decrease in Maryland amounted to 782,708 short tons, or over 15 per cent., and in Oregon to 33 1-3 per cent., of the product in 1899.

West Virginia showed the largest increase in tonnage, exceeding 20,000,000 tons for the first time. The next largest gain was an increase of 2,605,138 short tons in Ohio. The net gain in Pennsylvania amounted to 2,150,000 short tons. Alabama gained 800,000 tons, or 11 per cent. The most notable comparative gains were made in Arkansas, the Indian Territory, Michigan and Utah. Kansas increased her production 600,000 tons, or 16 per cent., and Kentucky 575,000 tons, or 12 per cent.

Following is the production and value of coal (in short tons) in the various States in 1900:

	Production. Tons.	Value.
Alabama	8,393,385	\$9,745,722
Arkansas	1,441,345	1,653,818
California	171,708	523,231
Colorado	5,232,843	5,848,339
Georgia and North Carolina.....	333,291	370,022
Illinois	25,153,929	22,529,665
Indiana	6,449,645	6,645,739
Indian Territory.....	1,018,572	2,782,838
Iowa	5,237,634	7,202,986
Kansas	4,453,107	5,368,642
Kentucky	5,181,917	4,730,698
Maryland	4,024,686	3,927,381
Michigan	849,455	1,257,683
Missouri	3,269,491	4,015,980
Montana	1,661,775	2,713,707
New Mexico.....	1,299,099	1,775,570
North Dakota.....	129,683	158,358
Ohio	19,105,408	19,403,362
Oregon	58,664	220,001
Pennsylvania—		
Anthracite	57,107,660	82,993,471
Bituminous	79,616,346	77,166,158
Tennessee	3,731,617	4,215,080
Texas	968,373	1,581,914
Utah	1,146,277	1,445,415
Virginia	2,137,007	1,757,525
Washington	2,474,093	4,700,068
West Virginia.....	21,980,430	17,698,734
Wyoming	4,014,602	5,457,953

Prior to 1899 Great Britain was the leading coal producing country of the world, but in that year the United States took first place. The production of Great Britain in 1900 amounted to 225,170,163 long tons, or 252,190,573 short tons, compared with which the United States has a lead of 15,300,000 short tons, or just double that of the preceding year.

The report to the stockholders of the Philadelphia Company of Pittsburgh is given as follows: Total earn-

ings from operations and other income for May, 1901, \$94,095.57; for 1900, \$57,936.18; for first five months of the year 1901, \$1,128,710.61; for the same period, 1900, \$1,031,184.76; deductions from income, including rentals of leased gas lines and interest, \$18,960.51, \$13,849.03, \$195,872.41, \$187,633.34; total income, \$75,135.06, \$44,087.15, \$932,828.20, \$843,551.42; net income of Philadelphia Company, surplus, \$40,760.05, \$10,232.99, \$761,094.43, \$674,321.83; total net income of affiliated corporations, \$79,341.04, \$46,945.78, \$504,140.62, \$416,875.08; less proportion of same credit of capital stock held by owners other than the Philadelphia Company, \$740.94, \$655.36, \$6531.86, \$5927.62; balance representing Philadelphia Company's interest in total net income of affiliated corporations, \$78,600.10, \$46,290.42, \$497,608.76, \$410,947.46.

Sweden as a Market for American Goods.

United States Consul General Winslow, at Stockholm, in a recent report to the State Department, urges American exporters not to overlook the opportunities for trade in Sweden. "When it is remembered," he says, "that Sweden is practically the door to Russia; that the forests of Scandinavia are just being tapped; that the iron deposits are among the largest in the world; that railways extend into the Arctic circle; that the water falls, as numerous as the cities, are just being harnessed, it can be imagined that the market will expand. Sweden has been an agricultural country, and even at the present day, 60 per cent. of the population are tillers of the soil; but year by year, as new factories, mills and plants are erected, the people are beginning to see that manufacture is profitable.

"The Government has adopted the policy of protection to these new lines of industry, and Swedish goods can now be found in most parts of the world. Anything that can be utilized in a land anxious to be 'up to date' can be sold in Sweden. Our commerce with this country has never been as great as at present, and it shows signs of reaching still larger dimensions. The merchants of the United States who have made the most progress are those that have appointed agents to represent them."

The Consul General notes that the 30 American locomotives that have been put upon the State railways are meeting with great praise, and the new engines under construction are patterned after them. More orders will probably be placed in the United States.

The B. F. Sturtevant Company.—After a most careful consideration of sites, the B. F. Sturtevant Company have recently completed the purchase, at Hyde Park, Mass., of a tract of land containing some 15 or more acres, and are preparing plans for the erection thereon of a large up to date plant for the manufacture of blowers, engines, motors, forges, heating apparatus, &c. This purchase, although hastened by the recent fire which damaged the works at Jamaica Plain, Mass., and which will be eventually abandoned, is the natural outcome of the rapid growth of this concern during the past few years, and of the congested condition of the present plant, in which increased facilities could not be advantageously provided. The new site is on the same railroad line, the New York, New Haven & Hartford Railroad, only 5 miles from the old plant and less than 10 miles from Boston. It is admirably located; 1300 feet along one side abut upon the railroad with all desired switching facilities, an ample stream of water marks the boundary on another side, a noted spring of remarkable purity is within the area, the high ground which is practically on a level with the tracks, will accommodate buildings having a floor area of 750,000 square feet, ample for all needs of the immediate future, and the lower land furnishes abundant area for dumping. The new plant will be arranged to reduce to a minimum the labor cost of handling material, and will provide for its direct progress through the shop from foundry to shipping room. It will be equipped throughout with new modern tools and labor saving devices.

The Iron Age

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DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

An Unnecessary Weakening of Prices.

The attention of large purchasers of iron and steel is called to a practice of long standing which should be discontinued for the benefit of trade generally. When contracts are to be made for quantities of material, and representatives of the manufacturers gather at an appointed time for the purpose of naming prices, it frequently happens that the buyer, after deciding upon the successful bidder, informs the unsuccessful ones that he regrets his inability to give them the business, but that the one favored with the order had made a lower price than they quoted. This may usually be absolutely correct. It has, however, transpired on some occasions that the buyer did not tell the exact truth, and made the statement simply because he desired to frame a satisfactory excuse for having shown a preference for one of the bidders. This practice has a natural tendency to weaken the market subsequently for the particular product which had been under negotiation. The unsuccessful bidders being led to believe that their prices are too high, take their departure with their minds made up to make more vigorous efforts to secure other business. If they are salesmen they inform their principals of the occurrence, and naturally endeavor to secure a better price to quote on the next contracts. If they are principals themselves, they are at once disposed to make lower prices, unless the demand is such that they feel confident that they will be able to secure their share of new business coming up without making the concessions apparently justified by this experience.

The policy thus pursued by the purchaser is not only a fit subject of attack from the manufacturers' standpoint, but it is also seriously unwise from that of the buyer himself. If the buyer is purchasing for a large manufacturing consumer his action in impressing the unsuccessful bidders that their prices were too high is well calculated to cause them to name considerably lower prices to his competitors in the same line. He thus assists these competitors to buy more cheaply than they otherwise would have been able to do. It would seem to be the proper policy for a buyer under any circumstances to content himself with stating that he had given the order to one of the bidders. No excuse would seem to be necessary to the others. This would then leave the way open for them to determine for themselves whether the successful bidder had been preferred on account of the relations of himself or his company to the buyer, or the quality or reputation of his product, or possibly a lower price. The chances are that the unsuccessful bidder would not immediately jump to the conclusion that a low price had been made. It would seem that very large consumers would be interested in endeavoring to keep prices of their materials up to the point at least at which they placed their own contracts. The matter is not referred to as anything new, as it has probably been a practice coming down from time immemorial. The point made, however, is worthy of earnest consideration, as it may have a good effect in maintaining prices.

The Fuel Oil Development in Texas.

Just what economic value to assign to the crude petroleum of the Beaumont and Corsicana fields, and to what extent the oil of the one and the residuum of the refineries of the other will displace coal in the industries which are looking for cheap fuel, are questions which possess great interest for the coal miners of Tennessee and Alabama, and in equal degree to the railroads which have hitherto derived an important part of their traffic from the carriage of coal to the Gulf ports and points South. Much significance attaches to the fact that the Louisville & Nashville Railroad have announced a reduction in their rate on coal from the Alabama fields to New Orleans from \$1.75 per ton to \$1.10. This rate for a coal haul averaging over 250 miles is probably unprecedented in Southern railroad tariffs, and it may safely be interpreted as meaning that it has been made either because of, or in anticipation of, an exigent necessity. Evidently the coal trade is already feeling the effects of a competition sufficiently serious to require that steps be taken to reduce to a minimum the inducements which are leading consumers to abandon coal and adopt oil. With the completion of the pipe line from Beaumont to New Orleans, it is understood that most, and perhaps all, of the railroads which have been in the habit of coaling their engines at that point will follow the example of the Atchison and Southern Pacific systems, and that many steam users, both on land and water, will do the same. The plans already made for the distribution of fuel oil over a large area are so extensive that at least for the present coal is likely to be displaced as a steam fuel. Discussion as to the character and chemical composition of the Texas oil is interesting and useful, but the impression is gaining ground that while it may be inferior to Pennsylvania oil in many respects, especially from the viewpoint of the refiner, it is a practical fuel, and cheaper than coal. An officer of the Tennessee Coal & Iron Company, at Birmingham, said on this subject a few days ago: "A large trade in coal controlled from this district for many years past has now come to an end, and our customers cannot be induced to renew contracts. A company with large capital have lately been organized by Mobile parties for bringing oil from Port Arthur to Gulf and river ports, and the storage tanks of large consumers will be filled direct from the barges at a minimum cost for transportation and handling. This company will not only interfere seriously with the trade of the Gulf ports in coal, but it is expected that they will extend their operations to river ports like Selma, Montgomery and Demopolis." The coal miners of the Indian Territory are experiencing the same difficulty in holding their contract customers, and look for a permanent shrinkage in the volume and profit of their business.

There is still some conflict, or perhaps confusion, of expert opinion as to the Texas oil, especially that from the Beaumont field. This is, perhaps, due to the fact that the development is still quite new, and that most of those who have claimed the public ear for a discussion of its characteristics have made *ex parte* arguments, intended either to boom the development or to discourage it. It is also probable that many writers have discussed the subject without sufficient knowledge and have given the public hasty and ill considered generalizations. Perhaps the best data at the moment available is that furnished by Dr. Robert T. Hill of the United States Geological Survey, who has lately completed a very thorough investigation of the Texas oil field, and from some 15 years' work in the Southwest

is probably as good an authority as there is concerning a field which he has long known about and is accredited with having discovered. Doctor Hill's conclusions respecting the Beaumont field are briefly summarized as follows:

The importance of this oil field is far greater than can at present be described or estimated. It means not only a cheap fuel supply to the largest State in area in the Union, which also ranks sixth in population, but, owing to its proximity, to an export trade such as exists nowhere else in this or any other country. Russia, from her deposits on the Caspian Sea, has hitherto produced a little more oil than has the United States. The Russian production has been over 60,000,000 barrels per annum. The seven wells so far opened at Beaumont, Texas, will alone produce over 90,000,000 barrels, or one and a half times as much as the Russian oil field.

This would seem to warrant the belief that the quantity of the Texas oil supply is at least as large as has been popularly believed. The extent of the area which will repay development is still indeterminate. For many years it has been known that oil existed in greater or less quantities in Western Louisiana and Texas, within a radius of 100 miles of Beaumont. It was long ago reported floating on the sea west of Port Sabine. Throughout this district petroleum springs have long been recognized, notably at Lake Charles, La. It has been encountered in well borings at least 100 miles southeast of Beaumont. The area which has given evidence of containing oil in quantities which will repay commercial development lies between the San Jacinto and Sabine rivers. This is the Beaumont field. Between that and the Tampico field, however, lies a vast area of the oil bearing eocene formation which has not been investigated and concerning which absolutely nothing is known.

As to the quality of the Beaumont oil, we are beginning to get facts which are of much more value than the chance opinions which have hitherto served the purpose of expert judgment. Dr. David T. Day, Chief of the Division of Mineral Resources of the United States Geological Survey, says in an article contributed to the June issue of the *Review of Reviews*:

Its use as a fuel has been established, whether it corrodes the boilers or not. The question comes as to the future. In regard to the prospect of using the oil for other purposes, we must remember, in the case of sulphur, that only a few years ago the problem of taking the sulphur from Ohio oils was unsolved, and yet fully as good illuminants are now obtained from the sulphur bearing oils of Ohio and Indiana as from any other source. The writer has had time for only brief examination of Beaumont oil, but from this it is already evident that the problem of taking out the sulphur is not at all difficult. In fact, it may conservatively be stated that the sulphur in this oil is likely to become a profitable source of sulphur to the trade.

Recent investigations undertaken for the cotton oil interest to determine the value of the Beaumont oil as a fuel in competition with coal have given results which are interesting and important. In a report presented to the Cotton Seed Crushers' Convention, lately held in Dallas, it was shown that oil is much cheaper than either wood or coal, so much cheaper, indeed, that no probable change in relative values will equalize them. Four barrels of oil of 42 gallons each, weighing 1260 pounds, are deemed fully equal to a ton of the best steam coal. Compared with ordinary Southern run of mine three barrels, or about 950 pounds, are said to equal a ton. As the oil is now selling at the wells at about 20 cents a barrel, it may be assumed to be equivalent to coal at 60 to 80 cents per ton at mine. A satisfactory adjustment of the freight rate has not yet been reached, but it goes without saying that it costs less to move $\frac{1}{2}$ ton a given distance than to move a ton the same distance, when both are moved in multiples of the compared units and in carload lots. What is regarded as a first-class equipment for burning fuel oil under a boiler costs about \$663, with an additional charge of about \$60 per boiler for burner and fire brick

construction in the combustion chamber. The average cost of \$663 covers the necessary arrangement of piping, pumps, valves, &c. An iron tank of approved construction, holding about 11,000 gallons, costs in the neighborhood of \$400. In plants which do not run continuously a small auxiliary boiler is needed to generate the steam required to begin the atomization of the oil in starting the fires.

From every point of view the economic importance of the discovery of oil in so many places and in such abundance, where other fuel is scarce and costly, is beyond estimate. Oil is now known to exist in quantities great enough to repay commercial development, when needed, in Virginia, West Virginia, Kentucky, Tennessee, Indian Territory, Texas, Kansas, Wyoming, Colorado and California. This, of course, makes no account of the great productive fields of Pennsylvania and Ohio. In some of these localities it is the only dependence for cheap fuel; in others its commercial development will be retarded by the fact that the local coal supplies are abundant and still cheap. This is not to be regretted. Much of the oil now useful chiefly for purposes of speculation will be needed a century hence, and its premature development will serve no good purpose.

Prosperous conditions are manifesting themselves in curious ways. The statement is made by a large tinware manufacturing company in a Western city that their trade in dinner pails has for some time been running heavily to the 5 and 6 quart sizes, the largest made. This is distinctly a new development. The dinner pails in ordinary use are the 3 and 4 quart sizes. The inference seems unmistakable that workmen are able to supply themselves with more food and a greater variety of it for their lunches.

Liquid Air for Blasting Purposes.

The problem of the exact field of usefulness of liquid air has been simplified by the elimination, for the present at least, of one class of work for which it was claimed that the new liquid would prove highly efficient—namely, its use as a blasting agent. A paper recently read before the British Institution of Mining Engineers by A. Larsen described some tests recently made in the Simpson tunnel with cartridges which consisted of a wrapper filled with a carbonaceous material, and placed bodily in liquid air until it was completely saturated. The cartridges were kept in the liquid, at the working face of the rock, until they were required for use, when they were lifted out, quickly placed in the shot holes and detonated with a small gun cotton primer and detonator. It was found that, owing to the rapid evaporation, the useful life of the cartridge was very short. The cartridges, which were 3 inches in diameter by 8 inches in length, had to be fired within 15 minutes after being taken out of the liquid air; otherwise there was danger of a misfire. It was chiefly on this account that the tests were discontinued. The disruptive effects, however, were said to be comparable to those of dynamite.

The Colonial Land Company, who will be an interest of the Colonial Steel Company, have bought about 400 acres of land in Monaca, where a town will be established, to be called Colona. The works of the Colonial Steel Company, comprising crucible and open hearth steel plant, will be built near this town.

The Allis-Chalmers Company, composed of the E. P. Allis Company, Fraser & Chalmers and the Gates Iron Works, have secured a large suite of rooms on the tenth floor of the Home Insurance Building, Chicago, in which they propose to establish their general offices on or before July 1.

PERSONAL.

H. B. Barnhard, superintendent of the open hearth furnaces at the Ensley, Ala., steel mill, has resigned to take charge of the steel casting plant of the Shickle-Harrison & Co.'s works at St. Louis, Mo.

H. W. Marsh, who was chosen manager of the insurance fund of the United States Steel Corporation a short time ago, has sailed for Europe to make arrangements for carrying the insurance of such plants as the corporation themselves might not care to assume.

Within the last six months Henry C. Frick, the well-known coke maker at Pittsburgh, has invested more than \$6,000,000 in real estate in that city. Mr. Frick's latest purchase was about 16 acres of land fronting on Fifth avenue and located near Carnegie Institute and Schenley Park. It is not known what Mr. Frick will do with his latest purchase, but it is intimated that a public building of some kind may be erected on the site. Mr. Frick last week laid the corner stone of the new Frick 22-story office building, now being erected on Fifth avenue and Grant street, in Pittsburgh. It will be much the finest office building in Pittsburgh. Mr. Frick is conceded to be the second largest real estate holder in Pittsburgh, Mrs. Mary E. Schenley being first. It is probable that Henry W. Oliver is the third largest owner of real estate in that city, having recently increased his holdings.

Frank N. Hoffstot, president of the Pressed Steel Car Company, has sailed for Europe and will remain abroad until September. Mr. Hoffstot will combine business with pleasure, and while abroad will give special attention to the methods of making cars. He will also devote some time to the making of plans for the further extension of the foreign trade of the Pressed Steel Car Company, his concern having received numerous orders recently for steel cars to go abroad.

On Thursday evening, June 13, a dinner was given in Pittsburgh to Joseph E. Schwab, formerly superintendent of the Duquesne Steel Works and blast furnaces, and recently appointed assistant to the president, Charles M. Schwab, of the United States Steel Corporation.

The heads of the different departments of the Berlin Iron Bridge Company, Berlin, Conn., presented to Charles M. Jarvis, the former president of the company, a handsome silver wine set of five pieces as a token of esteem on his retirement. Mr. Jarvis has started for an extended European trip.

Owing to ill health Charles B. Houston has resigned the presidency of the Tidewater Steel Company, of Chester, Pa. He is succeeded by George McCall of the firm of Dick Brothers of Philadelphia.

E. T. Barker, for 27 years secretary of the Pennsylvania Steel Company, Steelton, Pa., has resigned, and Frank Tenney has been appointed his successor.

W. R. Palmer will retire on July 1 from the superintendency of the Tennessee Coal, Iron & Railroad Company's steel plant at Ensley, Ala., and will be succeeded by John McConnell, formerly of Coatesville, Pa., who has been assistant to Mr. Palmer.

Charles J. Bushwa of Pittsburgh has been appointed superintendent of the new sheet mill being built by the Youngstown Iron & Steel Roofing Company at Youngstown, Ohio. He succeeds Edward A. Kern, who was killed in an accident at the new works on May 29 last. Hugh Anderson has been appointed master mechanic of the new sheet mill of this concern.

T. W. Robinson has been elected a director of the Illinois Steel Company.

J. M. Butler, who has had charge of the order department of the Republic Iron & Steel Company since the organization of the company, tendered his resignation, to take effect July 1, to accept an official position with the Inland Steel Company, Chicago, whose enlarged operations require such expert services. Prior to his connection with the Republic Iron & Steel Company Mr. Butler was assistant secretary and auditor of the Brown-Bonnell Iron Company, Youngstown, Ohio, whose employ he entered in 1880.

Trade Publications.

Flanged Fittings and Gate Valves.—A comprehensive catalogue has just been issued by the Crane Company of Chicago, presenting a list of flanged fittings and gate valves for 125 pounds working pressure, and low pressure flanged fittings for 50 pounds working pressure. The illustrations show the fittings in all shapes, comprising elbows, tees, single sweep tees, crosses, laterals, taper elbows, reducers of all shapes, base elbows and long radius elbows. The valves comprise wedge gate straightway valves, wedge disk straightway valves, wedge gate, with outside screw and yoke, wedge gate with indicator, wedge gate quick opening by lever, and wedge gate hydraulic lift. New dimension tables much simpler than those heretofore given are published in this connection with the illustrated flanged fittings. Fractions are eliminated, and the tables given will be found a great convenience to all engineers. The breaking strength of the standard flanged fittings which this company manufacture has been tested under hydraulic pressure and the bursting point has been found to be 700 pounds minimum per square inch. This factor of safety is very high, but the fittings not only have to stand the strain due to working pressure, but are also liable to unusual strains, such as water hammer, weight of piping, settling, &c., and for this reason the company keep the limit of the working pressure for which they recommend them down to a perfectly safe point. The results of tests are given, which have been made to determine the holding value of cast iron threads. These tests show that with a thread half the standard width the flange will break before the thread will strip. The company conclude from the tests made that ordinary cast iron screw joints are sufficiently strong for any steam pressure carried to-day. Another catalogue of fittings and gate valves for heavier use will be issued later.

Elevators.—An interesting catalogue has been issued by the Eaton & Prince Company, manufacturers of elevators for passenger and freight service, 70 to 76 Michigan street, Chicago. The company are manufacturers of a full line of elevators, comprising electric, hydraulic, steam, belt power and hand elevators. Conspicuous attention is given in this catalogue to the company's electric elevators. Their high speed electric passenger elevator can be operated with the current from a lighting plant, without affecting the lights, provided that the plant has sufficient capacity for doing the work without checking the speed of the engine. The starting current required is but little more than the running current, and it is let into the motor gradually and at a uniform rate of increase. A new electric direct connected moderate speed passenger and freight elevator is shown, which has been brought out to meet the demand for a simple, durable and efficient elevator at a reasonable cost for installation and a minimum cost for maintenance and operation. This elevator is for both floor and ceiling installation. Other elevators illustrated are the company's regular electric freight elevator, worm geared belt elevator, single belt elevator, and center lift hand elevator. A number of designs of elevator cages are also shown. As the company are making a specialty of elevator production, their plant has been especially equipped to turn out work of the highest grade in this line.

Power Transmitting Machinery.—A fine catalogue has just been issued by Stephens, Adamson & Co., who recently completed a well equipped plant at Aurora, Ill., for the special manufacture of power transmitting machinery. The catalogue covers all sorts of appliances used in this connection, such as collars, couplings, pulleys, pillow blocks, hangers, base plates, brackets, gears, clutch pulleys, tension carriages, sheaves, belt tighteners, &c. It forms an excellent handbook respecting this class of products, giving a great deal of desirable information relative to the appliances used, including methods of calculating the character of shafting desired for any class of work and illustrations of applications of rope drives to secure special service.

Electric Fire Hazard.

Edward Atkinson, president of the Boston Manufacturers' Mutual Fire Insurance Company, calls attention to the occurrence of fires directly traceable to electricity and summarizes the general conclusions for this experience as follows:

Any plant installed ten years or more ago will, in nine cases out of ten, come under what we may call the "wooden age" of electrical work—that is, when the switchboards, cleats, rosettes, ceiling buttons and cut outs were all more or less of wood; this class of fittings offers very little resistance to heat caused by arcing or by poor contacts. In inspecting a system where all the above named parts are of porcelain, it is fair to conclude that it is a modern installment and probably safe. On the other hand, all plants put in during the "wooden age" must be regarded with suspicion; they may be found in many respects defective, and may also have been subject to a greater measure of wear and tear than the plants which have of late been established. It may often happen that, while the wiring may need renewing, the switchboard may be safe, or *vice versa*; again, that both the wiring and switchboard may be passed, if the fittings are renewed. It would therefore be well, if any radical changes are advised, to consult the underwriters, who will then make an immediate inspection. It is the conviction of the adjusters and experts, by which the increasing number of very heavy losses in the general practice of underwriting are appraised, that a large and increasing part of the great fire waste in the last two or three years may be attributed to electric hazard.

Aluminum Patent Expired in England.

The Judicial Committee of the Privy Council, at a hearing on May 16, denied an application for the extension for another 14 years of a patent granted on May 24, 1887, to Arthur Charles Henderson, on the invention of Paul Louis Heroult of Paris, of an improved process for the manufacture of aluminum by electrolysis. This patent was subsequently assigned to the petitioners, the British Aluminum Company, Limited, by whom about \$2,650,000 have been spent in erecting mills and securing property at Milton, Staffordshire, and Greenock, on the Clyde. The petitioners have been able to put aluminum on the market at a profit, but claimed that they had not been able to pay a dividend, and that neither they nor the original inventor had been adequately remunerated. The petition was opposed by the Pittsburgh Reduction Company of New Kensington, Pa., and others on the ground that the invention was neither new nor useful, and that it was never likely to be useful to the public; also that the inventor had been adequately remunerated, having received over \$50,000, besides a share in the profits of the Swiss Aluminum Company, who were paying 8 per cent. dividends. It was further alleged that if the petitioners had not been able to pay dividends it was owing to the inflation of the capital of the company. The French and Belgian patents expire during the present year, after which, if the British patent were extended, it would be impossible for manufacturers in the United Kingdom to compete with foreign manufacturers. Evidence was given by Lord Kelvin, Professor Dewar and others. The Judicial Committee concluded that they did not see their way to granting a prolongation of the patent. The petition was therefore dismissed.

Reld, Williams & Co., 309 Fourth avenue, Pittsburgh, have been appointed Pittsburgh representatives of the Cumberland Steel Company, Cumberland, Md., manufacturers of turned and grooved polished steel shafting. They are also agents for the Ohio Paint & Varnish Company in the Pittsburgh district. The firm are at present negotiating the sale of the balance of the plant of the Columbia Iron & Steel Company, at Uniontown, Pa., which was taken over several years ago by the National Steel Company.

MANUFACTURING.

Iron and Steel.

The Empire Iron & Steel Company are considering the building of a new modern blast furnace at Oxford, N. J.

The 35-inch mill at the Homestead Steel Works of the Carnegie Steel Company, at Homestead, broke all records for output by turning out 15,600 tons of finished steel in May. The best previous record in this mill was 14,800 tons, turned out in April.

The Pulaski Iron Company, Pulaski, Va., have recently relined their furnace and started up again. The furnace was shut down from April 14 to June 3, and is now making 137 tons per day. The company hope in a few days to reach the full capacity of the furnace, which is 150 tons per day.

The Virginia Iron, Coal & Coke Company, Bristol, Va., have recently blown in their Watt Furnace at Middlesborough, which has been shut down since September last. They are now using half Ducktown ore and making low phosphorus foundry iron. Work is being pushed as rapidly as possible on the repairs of their Buena Vista Furnace, and they hope to blow it in by the middle of July, running on basic iron. No. 2 Crozer furnace, at Roanoke, which has been out of blast for repairs for six weeks, will resume operations on the 15th inst. The company have completed their coke oven plant at Looney Creek and are now running it to its full capacity of 300 tons of coke per day, the coal used and coke produced being the same as that manufactured at Stonega.

Shenango Furnace of the Shenango Furnace Company, at Sharpsville, Pa., is making some remarkable records in the production of Bessemer iron. This furnace is only 60 feet high and 14 feet in diameter at the bosh, and made in May 6600 tons of Bessemer sand iron. The furnace quotes from 87½ per cent. to 90 per cent. Mesaba ores, and during May there was not a single cast off of iron and there was less than 1 per cent. of flue dust.

The wages of the steel carriers at the Bessemer works of the Republic Iron & Steel Company, at Youngstown, have been increased 30 cents a day. The men now earn about \$2.10 per day.

R. S. Henderson, trustee of the Continental Iron Company, has been authorized to borrow \$7500, for making improvements at the Wheatland mill, Wheatland, Pa.

General Machinery.

Shenango Machine Company, Sharon, Pa., have signed the machinists' scale, giving the men a nine-hour day, and all the employees at this shop are now at work.

Chas. L. Pierce Machine Company, recently incorporated, have succeeded to the business of Chas. L. Pierce, Gardner, Mass. The company have installed machinery of latest design and do a general machine business.

The Huron Machine Works, Port Huron, Mich., have increased their capital stock from \$5000 to \$7500. H. C. Herr is treasurer.

The Arthur Fritsch Foundry & Machine Company of St. Louis, Mo., have increased their capital stock from \$24,000 to \$50,000 for the purpose of increasing their capacity to meet the heavy and steady demand for mining machinery. The officers are Arthur Fritsch, president; Edward A. Gessler, treasurer, and Ferd. H. Regel, secretary. Charles Weber is superintendent.

The Columbia & Puget Sound Railway Company have purchased ground in South Seattle, Wash., upon which they will erect new machine shop, round house, &c., plans for which have not yet been fully prepared. As soon as the new shops are completed the old ones will be removed from their present location near King street.

The American Machine & Foundry Company, Hanover, Pa., have under consideration the erection of a large brick addition to their plant, to be used for additional floor space and machine room, both of which they are very much in need of to take care of their increased business.

The Watson Machine Company, Paterson, N. J., manufacturers of cordage machinery, are to extend their line into the soft fiber machinery, such as jute, flax and hemp. This is important in that they will be the first company in this country to take up the manufacture of this class of machinery, which is manufactured by only two firms in Leeds, England, and one in Belfast, Ireland.

The Knoxville Foundry & Machine Company, Knoxville, Tenn., who were originally established in 1876, were reorganized in 1899. The old company's business had run down so that when it ceased only nine men were employed. Now the new company have 58 hands, the works running full time and three days a week half over. Up to the present only repair work has been done, but within a short time the manufacture of mining machinery and large shears, both belted and steam power, will be commenced.

James Rees & Co., Pittsburgh, builders of marine and land engines and boilers, and also of the Pittsburgh high speed auto-

matic and high speed rolling mill engines, have refused to grant the demands of their boiler makers for an advance of 20 per cent. in wages. It is claimed that for the past ten years the boiler manufacturers in Pittsburgh have been paying higher wages and working less hours than their competitors in other cities. To continue to do this and also give the men another advance of 20 per cent. is claimed to be entirely out of the question, and for this reason most of the boiler manufacturers in Pittsburgh have absolutely refused to accede to the demands of the men.

The plant of the Pittsburgh Locomotive & Car Works, in Allegheny, Pa., is now running as one of the constituent concerns of the American Locomotive Works. The business will be carried on under the same general conditions as heretofore, and for the present the plant will be in charge of the old officials.

The William Tod Company, engineers, founders and machinists, of Youngstown, Ohio, have closed contracts with the Colorado Fuel & Iron Company to furnish three blowing engines which will be duplicates of the four recently contracted for with the same company and similar to the large engine at the Ohio steel plant, only somewhat smaller. They will be of the vertical steeply cross compound type, with 90-inch blowing tubs and 48 and 90 inch cylinders, with 60-inch stroke.

Buildings and Bridges.

The American Bridge Company are the lowest bidders on the superstructure of a bascule bridge of the Scherzer type to be built over the Chicago River at Randolph street, Chicago, by the board of trustees of the sanitary district. The bridge will have a 200-foot opening. The bids were opened on the 12th inst., when it was found that the American Bridge Company named \$107,000 and the King Bridge Company \$112,500. The proprietors of a flour mill near the river may delay the completion of the bridge by legal proceedings, as they claim that it will obstruct the entrance to their property.

Wm. B. Scaife & Sons, Pittsburgh, Pa., have received a contract for the design and construction of the buildings for the new plant of the MacPherson Switch & Frog Company, at Niagara Falls, N. Y. Steel frame construction will be used throughout.

The W. J. Carlin Company, Pittsburgh, dealers in steel works and rolling mill machinery, steam shovels and contractors' plants, also Carlin locomotives, Nagle engines and Blake crushers, have recently added a structural department to their works in that city and are now prepared to receive orders for this class of work. The firm have erected a new building, which is fully equipped with modern machinery, and they have every facility for turning out work promptly and economically.

Collins & Norton, engineers and contractors, Springfield, Mass., have been awarded by the Draper Company of Hopedale, Mass., the contract for building a steel covered bridge between the new No. 6 and No. 7 mills.

The Virginia Bridge & Iron Company, Roanoke, Va., have within a month greatly increased their punching and riveting capacity, and they are about to place an order for a large electric traveling crane, which will improve their shipping facilities. They have uncompleted contracts on their books for about 120 bridges, besides a large quantity of steel structural work for shipment to every one of the Southern States. They manufacture steel bridges, turn tables, train sheds, structural steel for manufacturing plants, electric power houses, car barns, &c.

The Fletcher & Crowell Company, Portland, Maine, manufacturers of structural iron, successors to G. M. Stanwood & Co., are contemplating extensive additions and improvements to their plant on Commercial street. An additional story is to be built on the main building, and the offices, which are now on the first floor, will be removed to the second, the first being used for iron working machines of various kinds. Among new machines recently purchased are a steam hammer and a powerful iron cutting machine. The company report that their business has more than doubled during the past year.

Geo. L. Mesker & Co., architectural iron works, Evansville, Ind., will build a line of warehouses and an addition to the present establishment on the site of the building which was burned last December, if railroad facilities can be secured. The buildings will be 310 x 150 feet, of brick, stone and iron, three stories, and will be so arranged as to allow tracks and handling facilities in the rear.

Foundries.

The Pyott Foundry Company, 76 North Sangamon street, Chicago, have recently improved their plant by the erection of a two-story addition 75 x 120 feet, and by the installation of new equipment, including two cranes. They have extended their foundry yard a half block back and it now fronts on Morgan street.

The Sargent Company, Chicago, recently held an election of officers which resulted as follows: George M. Sargent, chairman Board of Directors; W. D. Sargent, president; H. K. Gilbert, vice-president and treasurer, and Day McBirney, secretary. The company are planning a considerable extension to their works at Chicago Heights, Ill.

The Miller Mfg. Company, Ellisville, Miss., manufacturers

of brass and gray iron castings, mill forgings, &c., are laying the foundations for a new building, 40 x 150 feet, to be used as a foundry and machine shop.

The new works of the Helmich Foundry-Machine Company, at Fairmont, W. Va., are now completed and in active operation. Equipped with new and modern tools, the plant is especially adapted for the manufacture of mine cars, tipples, self oiling car and truck wheels, machinery, castings, &c., orders for which the company are now prepared to fill.

The Featherstone Foundry & Machine Company, Chicago avenue and Halsted street, Chicago, have again enlarged their foundry. They have just received a large order for dredge machinery from Puget Sound, and with the contracts on hand they will be forced to work overtime.

The Wm. Ferguson Foundry Company, Hawthorne and Willow streets, Chicago, have recently installed a larger engine and have equipped their foundry with new tools, including an electric crane.

Thos. Hewitt's Sons & Co., Sherman Avenue Iron Works, East Newark, N. J., iron, brass and aluminum founders, have incorporated under the style of the Thos. Hewitt's Sons Company. The new company will double the capacity of their present plant, modernizing it throughout with all latest appliances, so as to handle the increased business.

The plant of the Southern Foundry & Supply Company, at Avondale, Ala., was destroyed by fire recently, the loss being from \$6000 to \$7000.

National Foundry Company, Erie, Pa., have greatly increased their capacity of late for the making of heavy gray iron castings by the installation of an electric traveling crane of 30 tons capacity in their foundry No. 1. This building is 250 x 110 feet, having a large molding floor, and with the new and very large core oven recently built, together with excellent railroad track facilities, this company are well equipped to take care of their large foundry trade.

The Milwaukee Steel Casting Company, Milwaukee, Wis., whose works were recently considerably damaged by fire, have had the loss adjusted and immediately thereafter put on a day and night force cleaning the machinery and equipment. Although the building was still in a somewhat demoralized condition they were able to begin to take off heats on the 15th inst. Although this is done with much additional expense it is the company's intention not to let their customers suffer any longer than absolutely necessary.

A fly wheel cast recently by the Hoeflinghoff & Laue Foundry Company of Cincinnati for the Lane & Bodley Company is said to be the largest casting ever made out of a cupola. The wheel is 18 feet in diameter and weighs 17,000 pounds.

Engines and Boilers.

The Murray Iron Works Company have considerably increased the capacity of their plant at Burlington, Iowa, during the past year, and still further improvements are under way. An addition has been built to the foundry. The boiler shop is being enlarged by the erection of a steel structure which is being put up around and over the present shop. This will give additional floor space and the head room will be sufficient for the use of electric traveling cranes to handle heavy work. Plans have also been prepared, and the structural steel is on the ground, for an addition to the Corliss engine shop.

The Cooley Cycloidal Engine Company have incorporated. Chas. S. Farquhar of Chandler & Farquhar, machine tools and supplies, 34-38 Federal street, Boston, Mass., is president.

Rogers Locomotive Works of Paterson, N. J., are at present employing about 450 men, about 150 of them in repairing the machinery, buildings, furnaces, tools, &c., putting everything in good condition preparatory to employing a full force of men on new locomotive work. The force is increased from day to day as rapidly as the receipt of materials used in construction warrants it. When in full operation with present facilities about 1400 men can be employed, but probably six weeks will elapse before a full force can be organized and systematically employed. A new 17-foot gap hydraulic riveter of the most modern construction is being put in the boiler shop, and will be in operation within 30 days. Other new tools will be put in and improvements and enlargements made from time to time as can be done without interfering with the ordinary routine of construction. Orders on hand now will keep the works busy until about December of the present year. R. Wells is general manager.

The Pittsburgh office of the Buckeye Engine Company, Salem, Ohio, have recently made sales of engines as follows: To Spang-Chalfant Company, one 500 horse-power engine; Labelle Iron Works, Steubenville plant, two 600 and one 750 horse-power engine; Pittsburgh Plate Glass Company, one 400 and one 300 horse-power; American Tin Plate Company, 250 horse-power engine for the New Castle plant; American Steel Hoop Company, 500 horse-power; Pioneer Mining & Mfg. Company, 350 horse-power; Mahoning Rubber Company, Youngstown, two 500 horse-power engines.

The Wildman Boiler Works, whose plant is at present at 1345 Carroll avenue, Chicago, are erecting a brick shop at 1278 and 1280 West Twelfth street. The main building will be 50 x

120 feet, and there will be an engine room 25 x 50 feet and an office 20 x 50 feet, two stories high.

The Bessemer Gas Engine Company, at Grove City, Pa., are enjoying a prosperous year, and with a goodly number of orders they have seen their way clear to add to their capacity by erecting new buildings.

The Wolfe Du Brie Company, Fremont, Ohio, have incorporated with a capital stock of \$10,000, to manufacture a gas engine under patents of S. R. Du Brie. A new brick building is under construction, which will have an entire glass roof and when completed will be equipped with the latest machinery, furnished by the Marshall-Huschart Machinery Company of Cleveland. The officers are James Wolfe, president; Stanley R. Du Brie, vice-president; Harry Pardoe, secretary and treasurer. Chas. R. Short will have charge of the mechanical department and W. B. Davidson will do the designing for the new company.

The Connecticut Valley Mfg. Company, Centerbrook, Conn., are building a large two-story brick addition to their plant, to be used in the manufacture of the Wright gas engine from 1½ to 5 horse-power.

Hardware.

The Chattanooga Steel Roofing Company, Chattanooga, Tenn., have at present a large number of orders in connection with new buildings in different parts of the South embracing architectural and cornice work and skylights. They have closed a contract for foreign shipment that will require fully 10,000 tons of cast and wrought iron and which will amount in money value to a half million dollars. They have also just received an order by cable for three heavy iron stairways.

Millers Falls Company, 28 Warren street, New York, are building an addition, 220 x 40 feet, to their factory at Millers Falls, Mass. A part, 70 x 40 feet, of this addition will be a one-story building in which the company intend to concentrate all their forging and tempering work. The remainder, 150 x 40 feet, will be a two-story building, devoted to shipping, packing, stock and assembling rooms. The structure will be built entirely of brick in modern design.

Plans are under way for the organization of the Peterboro Shovel Company, Peterboro, Ont., with a capital stock of \$60,000. The company will manufacture a full line of shovels, scoops and spades. The proposed factory will have a capacity of 100 dozen per day. A suitable site has been secured from the town of Peterboro on the junction of the Grand Trunk Railway and Canadian Pacific, and it is the intention of the company to be in a position to place their product in time for next spring's trade.

Osgood Scale Company, Binghamton, N. Y., advise us that there has been no time in the history of their concern when there was such a demand for Osgood scales as during the last five months. The company have been behind their orders since January first. The sale of the Osgood wagon scales has exceeded that of any previous year, while the demand for their Osgood and American portables has gone beyond their expectations. They have put on the market this year a line of 240-pound Union scales, with single and double beam, tin and brass scoops, and also a sliding poise Union. The manner in which the trade have taken hold of these scales has been very gratifying. The company have a new catalogue in the hands of the printer which will soon be issued.

Indiana Foundry Company, Limited, successors to Sutton Bros. & Bell, Indiana, Pa., manufacturers of foundry hardware, &c., have completed their new shops, and they advise us that their capacity is fully taxed by the business coming in. They state that their Sutton tuyere is now sold in every State, with a good demand from Canada and a rapidly expanding export demand.

Miscellaneous.

Marlin & Co., Incorporated, operating architectural sheet metal workers, Pittsburgh, have under way a project for the manufacture of glass skylights with a wire filling. Plans are not yet fully complete, but the concern expect to put the product on the market in a short time.

The Petersburg Iron Works Company, Petersburg, Va., have about doubled the capacity of their shipyard this year. They are constructing in the yard at present two vessels for the United States Government, one a lightship for the Cape Elizabeth station on the coast of Maine, and the other a large sea-going suction dredge for Charleston, S. C., ship channel. They also have a contract for the light tower for the Cape Fear station, N. C., and have just been awarded a contract for a large number of heavy projectors by the ordnance department of the United States Army.

The Franklin Machine Works, St. Paul, Minn., have removed their entire elevator manufacturing plant into the large factory buildings formerly occupied by the Taylor-Craig corporation, on West Fifth street, near Exchange. The new quarters give the company greatly improved facilities for taking care of their increasing business. The office address of the company is 205 West Fifth street.

The Davis Acetylene Company have removed from 141 South Clinton street to larger and more desirable quarters at 48 South Clinton street, Chicago. The company manufacture acetylene gas generators of any size desired.

The Co-operative Wagon & Machine Company, Salt Lake City, Utah, dealers in farm implements, have increased their capital stock from \$300,000 to \$500,000, \$100,000 of which will be issued July 1.

The Des Moines Scale & Mfg. Company, Des Moines, Iowa, have purchased a tract of land on which they intend to erect a factory which will give them four times the capacity of their present works. The main building will be 66 x 132 feet and three stories high, with a half basement in addition. It will be built of brick and will be of slow burning construction, and will be used for iron and brass foundries, a machine shop, carpenter shop, assembling room, stock room, &c. The scales made will include wagon scales, stock scales, warehouse scales, hopper scales capable of taking on and weighing a carload of grain at a time for use in elevators, railroad scales, &c.

Among recent contracts secured by the Webster Mfg. Company, Chicago, is one for the machinery for the new Illinois Central elevator which is to be erected at New Orleans; for all the elevating and conveying machinery for the Rialto elevator at South Chicago; a jack shaft for the Grand Trunk elevator at Portland, Maine, and four 1200 horse-power rope drives for the Catawba Power Company, Rock Hill, S. C.

The plant of the Humphreys Mfg. Company, at Mansfield, Ohio, was damaged by fire on June 6 to the extent that the manufacture of pumps and enameled goods will be delayed temporarily. They have a large stock of castings on hand and have arranged to continue the manufacture of pumps while the foundry is being rebuilt. The brass department was not damaged, and they will be able to make shipments of anything they manufacture in that line, also of plumbing goods, same as before.

Chas. A. Schieren & Co., 45-51 Ferry street, New York City, manufacturers of oak leather belting and lace leather, have completed a belt 164 feet long, 72 inches wide, three ply thick, for the People's Tramway Company's power plant at Danielson, Conn., which is believed to be the largest leather belt ever made for active work. The belt, now on exhibition at the Pan-American Exposition, in the Machinery and Transportation Building, is treated with a preparation which makes it proof against dampness and wet. The order was received from Sanderson & Porter, 32 Nassau street, New York City, who are consulting engineers for the People's Company.

The Ingram, Richardson Mfg. Company, referred to in these columns last week, have organized at Beaver Falls, Pa., with a capital of \$10,000, for the manufacture of enameled signs, refrigerator linings, washboards, electric work, &c. The buildings of the Midgeley Belt Works on College Hill have been leased and the company will proceed at once to put them in shape with furnaces, machinery, &c. Some \$5000 will be spent in equipping the plant, which will be provided with special facilities for taking away the dust, thus insuring perfect work, and the colors used will be entirely free from lead. The plant will be ready in a few weeks to begin operations. The officers and directors are Louis Ingram, president; Ernest Richardson, secretary; E. L. Hutchinson, treasurer; J. S. Louthan and Frederick Davidson.

The National Fire Proofing Company.—The National Fire Proofing Company of Pittsburgh will meet July 16 to vote upon a proposition to increase the capital stock from \$2,000,000 to \$5,000,000. The money is to be used to acquire the Raritan Hollow & Porous Brick Company, New York & New Jersey Fire Proofing Company and the International Clay Mfg. Company, all in the State of New Jersey; also two plants in Ohio, one at Osnaburg and the other at Magnolia. The acquisition of these plants will more than double the present capacity of the company and give them practically control of the business east of Chicago. Subscriptions will be received by the Mercantile Trust Company for \$1,000,000 of the preferred stock to be authorized, until June 22, 1901, inclusive, from stockholders of the company of record at the close of business on June 14, 1901, who will be entitled to subscribe for one-half share of preferred stock (par \$50), carrying with it a fourth share of common stock (par \$50), for each share of stock, either preferred or common, standing in his name on the books of the company at that date, or in other words, one full share of the new preferred stock, carrying therewith one-half share of the new common stock, for each two shares now held of either preferred or common. The balance of the increase will be subscribed for by some of the present owners of the plants to be purchased as part consideration therefor.

The Bordentown & Philadelphia Transportation Company have given a contract to the Pusey & Jones Company, Wilmington, Del., for a new steel steamboat to run between Bordentown, N. J., and Philadelphia.

The Machinists' Strike.

An Increasing Number of Works Resume.

Below we present the latest news relating to the machinists' strike, the general result of the developments during the week having been that quite a considerable number of plants have been started, in the majority of cases at mutual concessions:

Edwin Reynolds, president of the Administrative Council, has issued a statement addressed to the press, which is accompanied by the resolutions adopted in Chicago on May 28, and by the New York convention on June 12 and 13. These we have printed in recent issues of *The Iron Age*. The statement contains the following passages.

"Our issue in the present strike is simply one of defense against unfair and unjust demands of organized labor, not against unions or wages. We have been so harassed by the unions interfering with the management of our shops for the past year that the condition is no longer bearable. We insist on our right to introduce new methods and machines in our factories and to control our production. We believe that manufacturers must keep up with the progress of the world and run their shops on an economical, commercial basis, not on any false ideas of restricted production. We also insist upon our right to introduce piece work and premium plan into our shops, which the unions now oppose, but our association will not permit any member to make improper use of the premium plan or piece work. We wish it plainly understood that as an association we are not fighting unionism, but its abuses, and will employ union men or free men impartially."

Boston.

BOSTON, MASS., June 18, 1901.—There is little change in the status of the machinists' strike in this vicinity. At the machinists' headquarters in this city it is stated that the strike has been indorsed by the Amalgamated Society of Engineers in England, and that the Boston strikers propose to use this in their fight with the Atlantic Works, by urging engineers on British steamers to insist upon union conditions at shops where their vessels are repaired. From the same source comes the information that the strikers are still firm.

Yesterday the machinists employed by John W. Russell of Springfield, Mass., declined to work because Mr. Russell refused their request for a working day of nine hours with no reduction in wages. Mr. Russell claims that he did not expect the strike and that he had practically decided to grant the demand on August 1. He says that he has a contract for envelope machines that will make it impossible for him to grant the demand at this time.

The machinists employed by the Waltham Watch Tool Company of Springfield returned to work yesterday morning, having reached a satisfactory arrangement with the company.

Thirty-two machinists joined the Worcester, Mass., Union last Friday night, and it is believed that the machinists of that city will soon be organized.

On June 13 the Vaughn Machine Company of Peabody, Mass., conceded the demand for a working day of nine hours, with 12½ per cent. advance in wages. This affects 350 machinists, who will work only half a day Saturdays.

Superintendents of metal manufacturing companies in this vicinity have held a meeting at which they discussed the feasibility of forming an organization to offset the power of labor unions. The consensus of opinion favors such an organization.

The Settlement in Providence.

PROVIDENCE, R. I., June 18, 1901.—On Friday of last week the strike of the machinists at the Corliss Steam Engine Works branch of the International Power Company, Providence, came to an end. The officials of the company, after a consultation of an hour or more with the union committee, an agreement similar to that which brought the strike of the machinists at the Providence Engineering Works to a close week before last, was ac-

cepted, and the strike was formally declared off. The machinists returned to work Monday morning, and at the present time the shops are running full. In the agreement the company agree to operate the works on the schedule of 54 hours a week for day men, the time being laid out as follows: Nine and three-quarter hours for the first five days of the week and five and one-quarter hours on Saturday. While the company concede the shorter day, they make no concession in regard to the wage schedule and, like the strikers at the Providence Engineering Works, the machinists will receive but 54 hours' pay for 54 hours' work. The company, however, promise to post on October 1 a schedule showing the increase which they will be in condition to give, and with this promise the strikers have been obliged to be satisfied. A 54-hour week will be arranged for the night men, and the company will allow time and one-half for overtime to midnight, and double time for work after that hour and on Sundays and holidays, except for work on the plant, for which the present rates are to continue unchanged.

The winding up of the strikes at these two plants has brought the fact forcibly to the attention of the manufacturers in this State that the nine-hour movement has come to stay in the machinists' world, and as the conduct of the strike in these plants was regarded in the light of an experiment by the management of other shops there is no doubt that all the machine shop operators hereabouts will promptly fall into line and concede the short working day. All the shops have been requested to adopt the nine-hour schedule, and several have made favorable responses to the union. In regard to the increase of wages, there are but few of the shops that are at the present time in a position to grant this demand, and inasmuch as the difficulties at the Providence Engineering Works and the Corliss Steam Engine Works have been settled on the basis of a promise to do all possible in a short time, the general opinion is that the same action should be followed in the other plants.

Philadelphia.

PHILADELPHIA, PA., June 18, 1901.—The situation in this city has improved. The men out appear to be weakening and in several cases have returned to work without having any concessions granted them by their former employers. Among those still on strike the conditions remain unchanged, with neither side willing to agree to any but their own terms.

No further strikes have taken place during the past week and it begins to look as if the fight would narrow down to one or two plants.

In many cases men on strike are applying for their old positions as individuals, and are being employed as such; in other cases they are asking employment at shops in which no strikes have occurred, and they are being uniformly refused.

Ten men of the 14 who struck at the American Pulley Company's works have returned to work at the company's own terms.

The Pedrick & Ayer Company have their plant in comparatively good running order. Forty odd machinists employed as individuals and at the company's own terms are at work in their shops.

The directors of the Remington & Sherman Company conferred with their men on the 17th inst. and as a result the men decided to withdraw their petition and remain at work on the basis of ten hours' work and ten hours' pay.

An annoying telegraphic error in our report last week made us say that "the number of machinists conservatively estimated to be out at this time will not exceed 4000 men," &c. It should have read, "will not exceed 400 men," &c.

The St. Louis Settlement.

ST. LOUIS, MO., June 17, 1901.—The fact that the machinery manufacturers of this city were able to settle the threatened machinists' strike of last month without the loss of a day, when nearly every other city in the country has been having strikes, has caused much comment over the country. Is this city different from all the other cities? No. Demands were made in this city

by the International Association of Machinists the same as in all the other cities over the country. The local conditions, however, were such that it was possible for the employers and their employees to come to an amicable understanding.

All of the leading manufacturers of this city are members of the St. Louis Metal Trades Association. Each member of that association has pledged himself to follow and to be guided by the policy of the National Metal Trades Association. Under the direction of the National Metal Trades Association the wage question was made a local issue. The St. Louis Association therefore undertook and followed the only course left—that was to arbitrate locally. This was no easy task, and almost daily conferences were held for nearly two weeks between the local members of the National Metal Trades Association, the Executive Board of the St. Louis Metal Trades Association and the representatives of the local lodge of the International Association of Machinists. The original demand of the union was for the adoption of an agreement differing entirely from the New York joint agreement, and embodying a 30-cent minimum rate of wage and the adoption of a straight nine-hour workday. These were absolutely refused by the manufacturers and were withdrawn by the representatives of the union.

The manufacturers then stated to the union that according to the national interpretation the wage question was the only question that could be considered as a local issue, and, furthermore, no local agreements could be entered into at all—that a verbal understanding could only be arrived at. The wage question was only taken up for settlement after the machinists had expressed their willingness to live up to the New York agreement and to be guided by its terms. The machinists then demanded, first, a 30-cent minimum rate. This was refused them. The second demand was a 15 per cent. increase over their present rates. This was also refused by the manufacturers. The third demand was a 12½ per cent. increase. Again refused. The fourth demand, 10 per cent. increase now, and 2½ per cent. more in six months, was again refused. The fifth and last demand was for a 10 per cent. increase over the present rates. This was finally accepted by the manufacturers, after a special meeting.

The representatives of the machinists' union were very fair and square, and earned during the conference the respect of the manufacturers. Following is the resolution stating what the employers grant. The representatives of the union, on the other hand, stated verbally to the Conference Committee, and the same was made a part of the signed minutes of the conference, that the machinists appreciated the concession, both of hours and wages, which had been made, and understood the hardship it involved upon the firms granting the advance, and stated positively that the machinists would make no more demands for at least a year. They stated that they knew the shops must now be run at their greatest capacity to continue to prosper; that the men pledged their employers their heartiest co-operation to help make the shops produce to their maximum. No quibbling on details will be permitted, and the machinists will use every endeavor to help their employers make this change profitable. Any employee who shows a spirit to work against his employers' interests will not be upheld by his associates, and no time will be wasted and no effort spared.

A LOCAL UNDERSTANDING.

The resolutions, adopted by 35 manufacturers of machinery in this city and vicinity, show the terms upon which an understanding was reached:

Whereas, According to the New York agreement of May 18, 1900, by and between the National Metal Trades Association and the International Association of Machinists, the 54-hour week is to be inaugurated on May 20; and

Whereas, The machinists of St. Louis have asked in the manner prescribed for in a joint resolution of November 16, 1900, for an increase of wages, to take effect concurrent with the reduction in hours;

"Whereas, The machinists of St. Louis have reaffirmed their adherence to the principles as set forth in the said New York agreement and have stated positively to us their intention to be bound by the letter and spirit of said agreement; and

"Whereas, The members of the St. Louis Metal Trades Association have bound themselves to adhere to the principles of the said New York agreement; and

"Whereas, The machinists of St. Louis have agreed to acknowledge members of the St. Louis Metal Trades Association on the same basis as the members of the National Metal Trades Association; and

"Whereas, There has been a misunderstanding regarding the interpretation of the 54-hour week clause in the New York agreement; be it

"Resolved, That until a national arbitration may be had interpreting the 54-hour week clause in the New York agreement, said clause to read as follows:

"Fifty-four hours shall constitute a week's work. These hours shall be worked between 7 a. m. and 6 p. m., and a schedule thereof posted in the shop. All work outside of the above schedule to be paid for as overtime.

"Night gangs shall also work 54 hours a week on regular night schedule posted in the shop, and any time worked outside of the schedule hours shall be paid for as overtime. Be it further

"Resolved, That, in consideration of the foregoing agreements, we, the members of the St. Louis Metal Trades Association, do hereby grant an advance of 10 per cent. on the hourly wages now paid to the machinists in our employ."

The above resolution has been signed by the following firms in this city and vicinity:

Fulton Iron Works,	Curtis & Co., Mfg. Company,
St. Louis Iron & Machine Works,	Dehner-Wuerpel Mill Building Company,
Quick Meal Stove Company,	Barry-Webmiller Machine Company,
Kupferle Bros. Mfg. Company,	Geo. J. Fritz Foundry & Machine Company,
Milton F. Williams & Co.,	Arthur Fritsch Foundry & Machine Company,
Central Union Brass Company,	Esmueller Mill Furnishing Company,
Kraushaar Lamp & Reflector Company,	Remmers Pattern Company,
Yerkes & Finan W. W. Machine Company,	John Ramming Machine Company,
Medart Patent Pulley Company,	Whitman Agricultural Company,
N. O. Nelson Mfg. Company,	Shickle, Harrison & Howard Iron Works,
Selbel-Suessdorf Copper & Iron Mfg. Company,	Moon Elevator Company,
Fernholtz Brick Machine Company,	Fred. J. Swaine Machine Company,
Wagner Electric Mfg. Company,	Wm. Grundler Machine Company,
Schoellhorn-Albrecht Mfg. Company,	Chas. Sinning Machine Company,
Wm. Ellison & Sons Mfg. Company,	Bellville Pump & Skein Works,
A. Leshen & Sons Mfg. Company,	John Kiburtz Pattern Company,
Hall & Brown Wood Working Machine Company,	American Brake Company.
Standard Railway Equipment Company,	

Chicago.

CHICAGO, ILL., June 19, 1901.—(By Telegraph).—Exaggerated reports stating that a number of Chicago machinery manufacturers have surrendered to their striking employees during the past week have been published. These reports state that the concerns yielding are as follows: The Woods Motor Vehicle Company, El. A. Delano, the Simplex Railway Appliance Company, Kling Bros., Hanson & Tunlius, the Auto Machine Company, the Carl Anderson Machinery Company, the W. D. Gibson Spring Company, Surarus & Greenhill, Wm. Zoeller, and the Garden City Fan Company, employing an aggregate of 250 machinists. The daily papers in almost every case claim that the machinists have been set to work at the terms demanded on May 20—namely, the nine-hour day, 12½ per cent. advance, and the recognition of the union. Inquiry of the greater part of these firms discloses such facts as follows: The Garden City Fan Company re-employed seven machinists who were old employees and who had been receiving more than the scale demanded by the union. They have made no agreement with the union and are refusing to pay all

machinists an equal scale as asked by the union. E. A. Delano's men returned to work for the same wages paid previous to the strike, as after investigation they found that the wages they had been receiving were actually higher than demanded by the union. The settlement announced by Kling Bros. is not new, but had been made as early as May 28, the advance being granted but the union not being recognized. The Carl Anderson Machinery Company have not yet started up, but are negotiating with their men and expect them to return to work on the same scale of wages they were receiving when they left. Wm. Zoeller has made independent contracts with his men, granting about 6 per cent. advance in wages, but does not recognize the union. The W. D. Gibson Spring Company employ only three machinists and have had no difficulty. Surerus & Greenhill had a conference with their workmen last week and arranged a schedule of wages, advancing not more than 5 per cent., and gave them notice that those who did not report for work on Monday would be considered as having left the employment of the company, and their places would be filled by others. All returned to work without the signing of any agreement with the union. It will probably be found that in all other cases conditions have been exaggerated. The leaders of the Machinists' Union appear to be trying to get the smaller shops to work even if the full demands are not granted, hoping thus to be able to make a better fight against the larger establishments. The shops which are running with part force are slowly adding to the number of their workmen, receiving daily accessions. The employers whose shops are completely closed are in most instances making no effort to reopen them, but are simply awaiting developments.

THE MOLDERS' STRIKE.

The threatened molders' strike has been postponed to wait the result of an arbitration which has been arranged between representatives of the National Founders' Association and the Iron Molders' Union of North America. The conference will take place on the 24th inst. Pending this conference the local business agents of the Molders' Union have become more reasonable and have ordered men back to work in foundries employing both union and non-union workmen. The outlook is now more favorable for a settlement, although the foundrymen are firm in their determination not to concede the large advance in wages asked for.

Connecticut.

ANSONIA, CONN., June 19, 1901.—At the works of the Farrel Foundry & Machine Company of Ansonia, Conn., the men are still out. The citizens of Ansonia are evidently anxious to have the works placed in operation as soon as possible, for one of the residents asked Superintendent Bliss to meet a committee of three representative business men with the object of arriving at some settlement. Mr. Bliss is now looking into the matter to ascertain whether the parties referred to are actually in a position to act with the company. The feeling expressed among the employers in this section is that the strikers are no longer employees and consequently they cannot commence any direct negotiations with their former employees as a body. The disposition on the part of the employers is to act in accordance with the views of the other members of the National Metal Trades Association, and as the members of this organization have been advised not to negotiate with the strikers, it is probable that the men will have to come back to work at the company's terms and then attempt to arbitrate the matter of hours and wages.

A similar condition of affairs presents itself at Derby and Shelton. The men of the Driggs-Seabury Company of the former town and the Whitlock Machine Company of Shelton are still out, and the employers refuse to attempt to make any new arrangements until the men have returned to work.

We are telegraphically advised by the E. J. Manville Machine Company of Waterbury that in that city the machine shops are all running short handed, but are as firm in their purpose now as five weeks ago. A few

of the strikers are now returning to their old places, and shop committees are offering to waive everything but the short hours and long pay. Even on these terms there are no takers in sight.

The works of the Hartford Machine Screw Company, at New Haven, Conn., are running as usual on compromise arrangements.

From New Haven we are advised that the Eastern Machinery Company have no strike. They are running as usual.

It is reported that about 150 machinists of the Bulard Machine Tool Company of Bridgeport, Conn., have returned to work on the former basis.

At the Birmingham Iron Foundry, at Derby, Conn., all the men are out except the foremen and such helpers as can be used.

New York and Vicinity.

Two important changes are the result of the week. The men employed at the plant of the A. S. Cameron Steam Pump Works of New York have returned to work, having gained only experience, and as the result of a conference held on Tuesday the employees of R. Hoe & Co. will respond to the 7 o'clock whistle this morning. In the case of the Cameron Company the victory belongs entirely to the employers, as the men returned unconditionally and at the same rate of pay and hours as before the strike.

In the Hoe case the men are to get their ten hours' pay for nine hours' work, but the company need no longer recognize the union. It was the latter point which really was at the bottom of the trouble at this shop. Early last month when the men threatened to strike Mr. Hoe stated that he would give the men the shorter workday they asked for and at the increased pay, provided the union consented to nullify an agreement which was made some time ago and which tied the Hoe Company to recognition of the union in all shop matters. The principal disadvantage of this was found in the operation of automatic machines. The dictations of the union as to how the company should run their automatic machinery was becoming offensive and the company have been looking for a chance to honorably abrogate the agreement which held them to the union dictations. This is now accomplished.

At the Garvin Machine Company's works more than one-third of the men, or about 150 of them, are now back to work. They are working under the old schedule and a few of the men come straggling in every day. The shop is running nicely and, aided by a fine large stock, is not hampered materially by the strike.

There is no change at the works of the Watts-Campbell Company and the Hewes & Phillips Iron Works of Newark, N. J. The men are still out, and as the firms are members of the National Metal Trades Association they refuse to deal with the men until they have returned to work.

The Crocker-Wheeler Electric Works, at Ampere, N. J., are running full force, having secured outside help, and they are now turning away applicants for positions. The firm have granted nothing.

The machinists of the Sprague Electric Company, at Wattessing, N. J., are still out, as are also the men of the Maine Engine & Machine Company of Harrison, N. J. The strikers formerly employed at the latter works have held meetings to decide whether to go back or not, as some of the men were weakening, and it was decided to stay out. Those men who were anxious to get back to work are looking about for employment in other shops, and in some instances are accepting positions at wages lower than those that were paid to them before the strike. In most of the smaller shops in Newark, N. J., the employers have been able to fill the places of strikers with this floating element, who find it necessary to work, but will not return to their own shops.

At Plainfield, N. J., there is no change. The works of the Pond Machine Tool Company are practically closed down, as is also the shop of the Potter Printing Press Company and the Scott shop.

A few of the strikers have returned to the shop of

A. R. Worthington of Brooklyn. The company are holding out firmly and express the belief that the majority of the men will soon follow the lead of the handful who have already returned unconditionally. At the other shops of the International Steam Pump Company the situation is unchanged, the men still being out.

The following has been received from the Newark Machine Tool Works, Newark, N. J.: "Our men were induced to go out on strike last month by a very few union men, who have been for some time a disturbing element. No concession was made by us, and we are now running again with a full force."

Rochester.

The following has been received from the Gleason Tool Company of Rochester, N. Y.: "The strike against Knowlton & Beach and Gleason Tool Company of this city is over. The difference is now being arbitrated and there are no machinists out in Rochester."

Seneca Falls.

The Gould Mfg. Company have conceded 60 hours' pay for 55 hours' work from July 1 to September 1. After the latter date the shop will run 60 hours at 60 hours' pay.

Buffalo.

This morning all the men returned to work at the plant of the Niagara Machine & Tool Works on the ten-hour base, with no concessions. The condition is unchanged at the Buffalo Forge Company.

Scranton.

At Scranton the machinists of the Dickson Mfg. Company, owned by the American Locomotive Works, are still out to-day. All the blacksmiths returned to work on Monday.

Sharon.

Shenango Machine Company, Sharon, Pa., have signed the machinists' scale, giving the men a nine-hour day, and all the employees at this shop are now at work.

Baltimore.

The Detrick & Harvey Machine Company of Baltimore, Md., will start to-morrow, Thursday, on 54 hours per week and 57 hours' pay.

Cleveland Situation.

CLEVELAND, OHIO, June 17, 1901.—Evidence of the fact that leading manufacturers have determined to follow out the principles set forth in the Declaration of Principles is shown in the action taken by two leading Cleveland concerns to restrain their striking employees from interfering with the conduct of their business.

The Cleveland Punch & Shear Works Company, one of the two Cleveland concerns which are now affected by the machinists' strike, have brought suit in the Common Pleas Court at Cleveland to restrain a number of their former employees from interfering with the present employees, the majority of whom are imported men. In their petition the company state that on May 18 they discharged a number of their men, among them the defendants. It is claimed that since the defendants were discharged they have continued to loiter around the plant as pickets and have combined and conspired together for the unlawful purpose of intimidating the workmen who remained and others that were given employment since.

About the same time the Otis Steel Company brought suit in the United States Court against No. 218 of the Iron Molders' Union, asking that the members of the union be restrained from interfering with the work of the company's employees; from attempting to induce employees to leave the company; from congregating about the premises and placing pickets on duty about the plant, and from going to the homes of the employees for the purpose of intimidating their wives and families. Both cases will be heard within a few days. The trouble at the Otis Steel Company's plant grew out of the molders' strike of last year. No agreement was ever reached between the company and the men, and the Molders' Union has since maintained men on picket duty at the company's plant.

The unions have announced that they will fight the injunction proceedings to the last ditch.

Cincinnati.

CINCINNATI, OHIO, June 18, 1901.—(By Telegraph).—The strike situation, so far as superficial indications show, is not changed. No approach has been made officially by either side. If the shops were thrown open quite a number of stragglers would apply for work. This is just as it has been for the past two weeks, however. The payment of the first strike benefit has been completed, and more money is promised to the strikers this week or next. The discontent at this delay in benefits is quite manifest, though what effect it will have on the situation is problematical. Rumors of strikes in affiliated trades are not seriously considered.

None of the men of the Cincinnati Shaper Company of Cincinnati, Ohio, had returned on Tuesday.

The Bickford Drill & Tool Company wire us that all the strikers are still out. The others are working on the old basis.

Hamilton Situation.

At the petition of the Niles Tool Works of Hamilton, Ohio, Judge Dustin of Dayton has issued a restraining order against 167 striking employees of the company. The strikers are enjoined from interfering in any way with the business and present employees of the company.

Toledo.

Baker Brothers of Toledo telegraph us as follows to-day:

"After three weeks' strike the machinists granted our demand for handy men and piece work and other concessions. We granted the nine-hour day at ten hours' pay, but did not sign their agreement."

The Sharon Steel Company.—Frank H. Buhl, ex-president of the Sharon Steel Company, sold to William Flinn, George W. Darr and some other capitalists of Pittsburgh 10,000 shares of stock in the Sharon Steel Company at \$200 per share. The value of this stock is \$100, and the fact that it is commanding a premium of \$100 above par, when the works of the concern have not yet been started, is probably without parallel in the history of the steel trade. The sale of this stock by Mr. Buhl gives the Pittsburgh parties a controlling interest in the Sharon Steel Company.

The Bethlehem Steel Company.—No official confirmation can be obtained of the report that Charles M. Schwab has parted with his holdings of stock in the Bethlehem Steel Company and the Bethlehem Iron Company to those who are financing the Vickers Sons & Maxim negotiations.

The Neville Furnace.—The new blast furnace of American Steel & Wire Company on Neville Island, Pittsburgh, will be started this week. The engines have been running for some time and only a few finishing touches are to be made. The stack is expected to turn out 600 tons of iron daily, which will be used in the Oliver & Hainesworth Works of the concern.

The Republic Iron & Steel Company have put in operation the old forge at the Birmingham Rolling Mill Company, Birmingham, Ala. It was not done, however, as reported, because of any extraordinary activity in the finished iron market, but because the men were not getting out the work on the new forge that they should.

The Cambria Steel Company, Johnstown, Pa., have received an order from the Philadelphia & Reading Railroad for 1000 more steel cars. This is the second order received by the Cambria Steel Company from them, the first order being for 500 cars.

The Carnegie Steel Company will not make tin bars at the Edgar Thomson Works as intended. The equipment already installed, and that on the ground, will probably be taken to the Ohio works of the National Steel Company, at Youngstown, as much as possible.

The Pennsylvania Steel Company.

An Interest Purchased in the Cornwall Ore Banks.

The Pennsylvania Steel Company have purchased during the past week the holdings in the Cornwall Ore Banks and associated interests of the heirs of D. Dawson Coleman, of Mrs. Annie C. Rogers and of the Grubb family. The company have also acquired the interests in the Cornwall & Lebanon Railroad, represented by these parties. Report has it that the price paid was \$8,000,000, a part of which is to be taken from the treasury of the Pennsylvania Steel Company, while the balance is to be raised by means of a collateral trust loan.

The Cornwall Ore Banks are the most prominent iron ore property in the Eastern part of the United States, and have been worked for a good many years. The ore, which is a magnetite of medium quality, cropped out in a series of hills, the greater part of which, however, have been removed by the mining operations of the last century. The ore is very cheaply mined. While it is of Bessemer quality it carries less than 50 per cent. of iron and contains considerable sulphur and must therefore be roasted before it is charged into the furnace. For a long time, too, its copper contents were regarded by many in the industry as a serious drawback, but the fact that for many years steel rails and other steel products made almost exclusively of Cornwall ore have been marketed and have established a high reputation for quality has entirely removed these earlier doubts.

Ownership in the Cornwall Ore Banks has been split up among the heirs of the original owners until there are now 96 shares. It is understood that G. Dawson Coleman's holdings were 15% shares of the total of 96 shares, and that the other interests purchased carry this up to 34 shares out of the 96. A number of years since the Lackawanna Iron & Steel Company purchased the Robert Coleman interest, and now control about the same amount as the Pennsylvania Steel Company, through their recent acquisition. There has, therefore, been a concentration of interests in the hands of the two steel companies named who now control fully two-thirds of the Cornwall property. A part of the purchase of the Pennsylvania Steel Company are the two furnaces of the Lebanon Iron Company, one of which has only been recently remodeled. The two together produce about 10,000 tons per month. The capacity of production of the Cornwall Ore Banks has never been seriously tested. In 1897 the output was only 419,878 gross tons. It rose, however, in 1898 to 584,342 tons, and in 1899 to 763,152 tons, and which probably has been exceeded in the year 1900.

It is a well-known fact in the Eastern iron trade that the cost of mining of this ore is very low, and that modern improvements in roasting furnaces have very considerably reduced the cost of preparing the ore for the furnaces. As a rule a price has been fixed by the Cornwall Ore Association considerably above that of cost, and yet in recent years rarely above 90 cents to \$1 per ton.

The De Frees Thermotor Company.—Arthur Jordan and Thomas M. De Frees have formed a partnership under the style of the De Frees Thermotor Company for the manufacture of a gas and oil engine invented by Mr. De Frees. The value of the thermotor lies in its entire absence from valves, the engine being so constructed that the piston acts in this capacity, its compactness, durability and especially its economy. On plants above 10 horse-power the engine is reported to consume in eight hours 15 gallons of crude petroleum at a cost of 1½ cents per gallon, from which is obtained 4 gallons of residue, which makes a very good and successful lubricant, which can be sold for 5 cents a gallon; thus the fuel account is reduced to a minimum. For three years the engine has been manufactured on a small scale and has been in successful operation. At a test recently made a three-cylinder, 110 horse-power engine successfully propelled a Pullman car 40 miles

per hour. The company have secured the three-story building, 50 x 130 feet, at Pike and Hovey streets, Indianapolis, Ind., formerly occupied by the Howe Pump Works, and work is now under way with a few men. Before long they will be running with full force. They intend to build engines, either one, two or three cylinders, from 1 to 100 horse-power, and will pay special attention to the construction of engines for automobiles, pumping oil wells and for farmers' use.

The National Steel Company.

A meeting of the stockholders of the National Steel Company is to be held on the 27th inst. to vote on the leasing of the concern to the Carnegie Steel Company. Since the United States Steel Corporation own practically all of the stock of the National Steel Company it may be accepted as a foregone conclusion that the plan will be carried out. This is a radical departure from the general scheme adopted by those in control of the Corporation to allow each constituent interest to manage the property.

It is explained that in reality it would be merely a duplication of forces to continue the present system in this particular case, since the products of the National Steel Company are identical with the cruder lines produced by the Carnegie Steel Company. As matters stand to-day, the National Steel Company make billets and sheet and tin plate bars, the whole product being practically taken by the finishing mills of plants controlled by the United States Steel Corporation. Therefore very little selling has been done to outside parties, while the purchases of what little raw material is taken from the open market are guided by the central authority. The general management of the plants, of course, can be better handled, as it ought to be, in harmony with those of the Carnegie Steel Company and the Federal Steel Company. Still, that would in a measure apply also to the original constituent companies of the Federal Steel Company and to certain departments of the American Steel & Wire Company. There have been reports in the trade of further similar fusion of constituent interests.

The *personnel* of the New York general office of the National Steel Company will remove to Pittsburgh on July 1, the offices to be those vacated by the Oliver Iron Mining Company in the Carnegie Building.

We are advised that the same procedure as to consolidation with the Carnegie Steel Company will also be carried out in the case of the American Steel Hoop Company. The company differ in one respect from the other finishing companies of the Moore group in that, like the National Steel Company, they own ore and coal property and operate coke ovens and blast furnaces. One of their important lines of products, steel bars, is made also on a large scale by the Carnegie Steel Company.

The Colonial Steel Company.—PITTSBURGH, PA., June 19, 1901.—(By Telegraph.)—The Colonial Steel Company, recently organized in Pittsburgh, have opened offices in Rooms 402 and 403 Bank of Commerce Building, Sixth avenue and Wood street, in this city. This concern are rapidly getting matters in shape to commence work on their crucible steel plant, which will be located at Monaca, on Pittsburgh & Lake Erie Railroad, and have placed a contract for their steel buildings with William B. Sealife & Sons of Pittsburgh. The officials of the Colonial Steel Company are: James W. Brown, president; George A. Howe, vice-president; T. H. Childs, second vice-President and general manager, and Charles M. Brown, secretary and treasurer. James W. Brown, president of the concern, sailed for Europe, Wednesday, June 19, and will be gone two months. He will combine business with pleasure.

Frank H. Buhl of Sharon, Pa., who has sold out his controlling interest in Sharon Steel Company to William Flinn, George W. Darr and others in Pittsburgh, says that he is interested in a new company to build a large forge at Sharon.

The Iron and Metal Trades.

While Pittsburgh reports all affirm that very considerable quantities of Bessemer Pig have been taken in that market for immediate and July delivery, it is officially stated by men in authority in this city that the total purchases on account of the United States Steel Corporation have not exceeded 15,000 tons in the last two weeks, and that the purchases reported if made were not on their account. The former reports that the Colorado Fuel & Iron Company had purchased 50,000 tons are denied by the president of the company.

From other districts, in Foundry and Forge Iron, comes the evidence of an awakening interest in the Pig Iron market. Some buying by rolling mills, pipe works, implement makers and others has taken place, and it is intimated that really more business has been placed, notably in the South, than is generally acknowledged. It appears that the sellers made attractive prices to start the ball rolling.

In Ferromanganese the stronghold of the domestic producers, Pittsburgh, has been invaded by both German and English makers, who appear to have secured business at \$53.50, delivered.

The scarcity of Steel continues, and for small lots for prompt delivery high prices are being paid.

In the Rail trade some foreign inquiries are at hand, but nothing can be done for many months to come, the mills being overcrowded with work.

Reports from the Finished Iron and Steel trade are generally quite favorable. Comparatively a small volume of tonnage of new work is now coming to the Structural mills. The Western Plate mills have taken some shipyard work for the Lakes, but, generally speaking, this branch, too, has been quiet. Pressure on the Wire mills and on the makers of Sheets continues, and as yet no improvement in deliveries has taken place. A good deal of shifting from one mill to another is going on. In the Bar trade there are indications in some quarters of a desire to capture additional tonnage, and a little weakness has developed.

Conferences are now going on between some of the leading Western Iron interests and the officers of the Amalgamated Association, the outcome of which is still in the dark.

Very little business is being done in the export trade in the heavier lines. Some inquiries are coming to the Bridge builders, but in recent lettings they have not been successful, lower European bids taking the business.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

PIG IRON:	June 19, 1901.	June 12, 1901.	May 22, 1901.	June 30, 1900.
Foundry Pig, No. 2, Standard, Philadelphia	\$15.00	\$15.00	\$15.00	\$18.50
Foundry Pig, No. 2, Southern, Cincinnati	13.25	13.50	13.75	18.25
Foundry Pig, No. 2, Local, Chicago	15.00	15.00	15.50	20.00
Bessemer Pig, Pittsburgh	16.00	16.00	16.25	30.00
Gray Forge, Pittsburgh	13.75	14.00	14.75	17.00
Lake Superior Charcoal, Chicago	17.00	17.00	17.50	23.00

BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh (nom)....	24.50	24.50	24.00	28.00
Steel Billets, Philadelphia (nom) .	26.75	27.00	26.00	29.00
Steel Billets, Chicago, (nom).....				nom.
Wire Rods (delivered)	39.00	39.00	39.00	35.00
Steel Rails, Heavy, Eastern Mill..	28.00	28.00	28.00	35.00
Spikes, Tidewater	1.80	1.80	1.80	2.15
Splice Bars, Tidewater.....	1.40	1.40	1.40	2.15

OLD MATERIAL:

O. Steel Rails, Chicago, gross ton	13.00	13.00	13.50	12.00
O. Steel Rails, Philadelphia	15.00	15.75	16.25	17.00
O. Iron Rails, Chicago, gross ton .	18.50	18.50	19.00	15.00
O. Iron Rails, Philadelphia.....	19.00	19.00	19.50	17.00
O. Car Wheels, Chicago, gross ton.	16.50	16.50	16.50	20.00
O. Car Wheels, Philadelphia.....	17.50	17.50	17.50	18.00
Heavy Steel Scrap, Chicago, g. ton	13.00	13.00	13.50	12.50

FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia...	1.55	1.55	1.50	1.55
Common Iron Bars, Chicago.....	1.55	1.55	1.55	1.70
Common Iron Bars, Youngstown..	1.45	1.45	1.45	1.60
Steel Bars, Tidewater	1.62½	1.62½	1.62½	1.65
Steel Bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank Plates, Tidewater.....	1.75	1.75	1.80	1.60
Tank Plates, Pittsburgh	1.00	1.00	1.00	1.40
Beams, Tidewater.....	1.75	1.75	1.70	2.05
Beams, Pittsburgh	1.60	1.60	1.60	1.90
Angles, Tidewater	1.75	1.75	1.75	1.95
Angles, Pittsburgh.....	1.60	1.60	1.60	1.80
Skelp, Grooved Iron, Pittsburgh..	1.82½	1.80	1.75	1.50
Skelp, Sheared Iron, Pittsburgh .	1.90	1.85	1.80	1.50
Sheets, No. 27, Pittsburgh.....	3.20	3.20	3.20	3.00
Barb Wire, f.o.b. Pittsburgh.....	2.90	2.90	2.90	2.80
Wire Nails, f.o.b. Pittsburgh	2.30	2.30	2.30	2.20
Cut Nails, Mill.....	2.00	2.00	2.00	2.05

METALS:

Copper, New York.....	17.00	17.00	17.00	16.25
Spelter, St. Louis	3.80	3.80	3.80	4.00
Lead, New York	4.37½	4.37½	4.37½	3.75
Lead, St. Louis	4.27½	4.30	4.22½	3.65
Tin, New York	28.15	28.75	27.50	30.00
Antimony, Hallett, New York ..	8.75	8.75	8.75	9.62½
Nickel, New York.....	60.00	60.00	60.00	55.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	4.19	4.19	4.19	4.84

Chicago.

1205 FISHER BUILDING, June 19, 1901.—(By Telegraph.)

Varied influences are operating for the improvement of the tone of the market. The postponement of the threatened molders' strike and the possibility of an adjustment of points in dispute on June 24 have had a favorable effect on Pig Iron. Finished Material is strong in anticipation of the closing of the mills during July for repairs, and to await the settlement of the wages scale. The gradual starting up of machinery establishments is also having a good effect, even though a great majority are still idle. Every man put to work helps to improve the situation, no matter what the arrangements may be. The leading forces in this contest are apparently as strongly arrayed against each other as before, and it will be some time until everything is again running smoothly. The condition of general trade with outlying districts continues very satisfactory, the crop prospects being decidedly encouraging to important manufacturing interests.

Pig Iron.—The situation has changed for the better. A great deal of business is believed to have been secured by Southern furnace companies at quite low prices during the week, but the lowest sellers have evidently secured enough tonnage to satisfy them for the present, as they have withdrawn their lowest rates. The transactions of the week embraced quite a number of 1000-

ton lots, and in some cases orders for 1500 and 2000 tons were placed. The buyers included Car Wheel manufacturers, Malleable foundrymen, implement makers, and even machinery manufacturers to some extent. A great deal of inquiry is now in hand and considerably more buying will be done in the near future. Many consumers are finding July 1 is near at hand, when the contracts will expire, and as the demand for their products keeps up it is necessary for them to arrange for more material. A feature imparting special strength to the situation is the fact that many who have contracts running into the last half of the year have been urging furnacemen to anticipate shipments to such an extent that much less Iron is due them than their contracts call for. Our quotations show a little recession from prices in some cases, but it is asserted that it is now difficult to secure any lower rates than are quoted. We quote as follows:

Lake Superior Charcoal.....	\$17.00 to \$18.00
Local Coke Foundry, No. 1.....	15.50 to 16.00
Local Coke Foundry, No. 2.....	15.00 to 15.50
Local Coke Foundry, No. 3.....	14.50 to 15.00
Local Scotch, No. 1.....	15.75 to 16.25
Ohio Strong Softeners, No. 1.....	16.00 to 16.50
Southern Silvery, according to Silicon.....	14.90 to 15.15
Southern Coke, No. 1.....	14.05 to 14.90
Southern Coke, No. 2.....	14.15 to 14.40
Southern Coke, No. 3.....	13.65 to 13.90
Southern Coke, No. 1 Soft.....	14.65 to 14.90
Southern Coke, No. 2 Soft.....	14.15 to 14.40
Foundry Forge.....	13.15 to 13.40
Gray Forge and Mottled.....	12.90 to 13.15
Southern Charcoal Softeners, according to Silicon.....	15.00 to 16.50
Tennessee Silicon Pig.....	16.00 to 17.00
Alabama and Georgia Car Wheel.....	19.90 to 24.00
Malleable Bessemer.....	16.25 to 16.50
Standard Bessemer.....	17.50 to 18.00
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	16.50 to 17.00

Bars.—Increased business is reported in both Iron and Steel Bars. The demand is stimulated to some extent by the expectation that mills pretty generally will be closed during July. Contracts are at the same time being placed for delivery running through the last half of the year. The good condition of trade, therefore, is not simply due to the temporary stimulant of an early shutting down of mills. A special feature of current trade is a lively demand for very quick shipment. Consumers are using much more than they had anticipated. The good condition of business is apparently not dependent on any particular class of trade, as the buyers represent the general line of consumers. Prices are somewhat firmer than a week ago. Mill shipments of Common Iron or Soft Steel Bars are quoted at 1.55c., Chicago. Manufacturers ask 1.60c. to 1.65c. for carload lots of Steel Bars. Hoops are held at 2c. Jobbers report a continued large movement from stock which is fully up to the heavy trade of May. Small lots are quoted at 1.90c. to 2c. for either Iron or Steel Bars, and 2.20c. to 2.25c., base, for Hoops.

Structural Material.—The American Bridge Company were the lowest bidders on a bascule bridge to be built over the Chicago River at Randolph street. Several other city contracts of the same character are coming up soon, involving a considerable tonnage. The general demand for Structural Material has not been quite so active during the week. The bridge companies and the car works are, however, very busy and are using up large quantities of material, making specifications fully up to the terms of their contracts. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—The demand has been excellent, but no large transactions have come to light. Prices are maintained and from present appearances are likely to be firmly held for some time. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c.; Marine, 1.95c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—The mills are making some better deliveries,

but are still far in arrears on contracts. One of the largest buyers in this vicinity has just received an invoice on an order placed early in April. This shows how far back the mills are even now. Jobbers report a continued heavy movement from stock. It is surprising how well the demand keeps up for both Black and Galvanized Sheets. Small lots of No. 27 Black are held at 3.40c. to 3.50c., and Galvanized at 65 and 10 to 70 off.

Merchant Pipe.—No falling off in the demand has been observed. Orders continue to be freely received from all sections of the territory tributary to this city. Manufacturers' prices, random lengths, are as follows:

	In carloads.	Less than carloads.
	Blk. Galvd.	Blk. Galvd.
½ to ¾ inch and 11 to 12 inches.....	59.2	46.2 54.9 40.9
¾ to 10 inches.....	66.7	53.3 61.9 49.9

Boiler Tubes.—Jobbers report a steady demand. Quotations on less than carloads from jobbers' stocks are as follows:

	Steel.	Iron.
1 to 2½ inches.....	50	40
2½ to 5 inches.....	57½	47½
6 inches and larger.....	50 and 5	47½

Rails and Track Supplies.—Inquiries for Rails are surprisingly plentiful in view of the fact that manufacturers are already known to be sold up to the closing months of the year. Considerably more business could be taken if it was possible to increase the output. Prices are firmly held at \$28 to \$33, according to section. Track Fastenings are in excellent demand. Quotations are as follows: Splice Bars, 1.75c. to 1.80c.; Spikes, 1.95c. to 2c.; Track Bolts, with Hexagon Nuts, 2.80c.; with Square Nuts, 2.65c.

Merchant Steel.—A fair trade is reported by manufacturers, but the week has not developed any specially heavy business. The mills are crowded with work, and a period of quiet in the receipt of new orders is not unwelcome. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off. Ordinary grades of Crucible Tool Steel are quoted at 6½c. for carloads and 7c. to 7½c. from store; Specials, 12c. upward.

Old Material.—The movement has been light. Large consumers are buying very sparingly, as they expect to shut down July 1. Dealers are accepting the situation and are not pressing much material on the market. The supply is plentiful, the railroad companies now having larger quantities to offer than early in the spring. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$18.50 to \$18.75
Old Steel Rails, mixed lengths.....	13.00 to 13.50
Old Steel Rails, long lengths.....	15.00 to 15.50
Heavy Relaying Rails.....	21.00 to 22.00
Old Car Wheels.....	16.50 to 17.00
Heavy Melting Steel Scrap.....	13.00 to 13.50
Mixed Steel.....	11.00 to 11.50

The following quotations are per net ton:

Iron Fish Plates.....	\$16.00 to \$16.50
Iron Car Axles.....	18.50 to 19.00
Steel Car Axles.....	15.50 to 16.00
No. 1 Railroad Wrought.....	14.00 to 14.50
No. 2 Railroad Wrought.....	12.00 to 12.50
Shafting.....	15.50 to 16.00
No. 1 Dealers' Forge.....	12.00 to 12.50
No. 1 Bushing and Wrought Pipe.....	10.50 to 11.00
Iron Axle Turnings.....	9.50 to 10.00
Soft Steel Axle Turnings.....	9.00 to 9.50
Machine Shop Turnings.....	8.50 to 9.00
Cast Borings.....	4.00 to 4.25
Mixed Borings, &c.....	4.50 to 5.00
No. 1 Boilers, cut.....	11.50 to 12.00
No. 2 Boilers, cut.....	9.50 to 10.00
Heavy Cast Scrap.....	10.50 to 11.00
Stove Plate and Light Cast Scrap.....	8.00 to 8.50
Railroad Malleable.....	11.50 to 12.00
Agricultural Malleable.....	10.50 to 11.00

Metals.—Copper unchanged at 17½c. for carload lots of Lake, and 17¼c. for Casting brands. Pig Lead is still quoted at 4.32½c. for Desilverized, and 4.42½c. for Corroding in 50-ton lots.

Coke.—Some consumers are inclined to make contracts for future delivery, but the general demand from the foundries has fallen off considerably. Prices are unchanged at \$4.50 to \$5 for 72-hour Foundry Coke.

Philadelphia.

FORREST BUILDING, June 18, 1901.

There is no distinct change to note in Iron and Steel as regards either prices or demand, but there is a great deal more inquiry. Consumers realize the fact that the statistical position is very strong, and since the publication of the furnace report in last week's *Iron Age*, a great many inquiries have been made for quotations. Buyers are evidently carefully considering the situation, and it is not at all unlikely that some heavy buying will be done before the end of the month. There is nothing in sight to indicate lower prices, even if there is a further postponement of buying, stocks of Pig Iron being too light to cause any selling pressure. Plates and Bars are not called for with as much urgency as they were some time ago, but this is due to causes which may be temporary. The cessation of work at some of the shipyards, a partial suspension in one or two other departments, has led to requests for postponements of deliveries, so that while there is plenty of business on the books, it is easier to get prompt shipments on new orders than it has been for several weeks past. It is hoped, however, that this is only a temporary condition, and that in the near future work will proceed as usual. The unsettled condition of labor is the only obstacle to a very heavy business in nearly all branches, but until that difficulty is removed it is not to be expected that new engagements of any great importance will be entered upon.

In last week's article a typographical error made us say that the circular letter sent out by Mathew Addy & Co. was "worth nothing." The original copy said it was worth noting, which is an entirely different thing. Subsequent events seem to confirm the suggestions made by Addy & Co.

Pig Iron.—The market begins to look better. There is more inquiry, more business and prospects of considerably larger sales in the near future. Stocks on furnace banks are gradually diminishing, contracts are beginning to run out, and as the amount of Iron in consumers' yards is said to be quite small, there must necessarily be a heavy demand within a very brief period. The number and character of the inquiries that are being sent in indicate a movement of this kind, and it is not unlikely that before the close of the month a considerable amount of business will have been placed. Somewhat heavy sales have already been made to the local Pipe founders, and also a very fair amount for Puddling Iron, but at rather low prices—say \$13.60 to \$14, delivered. Foundry Irons have not been taken to any great extent, and for the present they are dull and easy at the figures quoted last week. Sellers are quite hopeful, however, and from present appearances prices are not likely to go much (if anything) below those recently ruling, while under a good demand such as may be now reasonably expected they might stiffen up 25c. to 50c. per ton. It is a waiting market, however, with prospects that are believed to favor improvement. It is reported to-day that a good sized lot of Basic Iron has been taken at a figure close to our quoted rates. Prices about as follows for seaboard or nearby deliveries: No. 1 X Foundry, \$16 to \$16.25; No. 2 X Foundry, \$15 to \$15.50; No. 2 Plain, \$14.50 to \$14.75; Standard Gray Forge, \$14 to \$14.25; Ordinary Gray Forge, \$13.50 to \$13.75; Basic (Chilled), \$14.25 to \$14.50.

Billets.—Steel for prompt shipment is held at \$26.75 to \$27, but for the fall months \$26 to \$26.20 could probably be done.

Plates.—The demand is very satisfactory, and the mills are kept employed to their full capacity. Orders are not in specially large lots, but there is sufficient to offset deliveries, so that there is no impairment to the general situation. Something of a pause would not be surprising, however, considering the near approach of the midsummer holidays, but the outlook is favorable and prices are well maintained and quoted as follows for city and nearby deliveries: Plates, $\frac{1}{4}$ inch and thicker, 1.75c. to 1.80c.; Universals, 1.75c. to 1.80c.; Flange, 1.90c. to 2.10c.

Structural Material.—Business in this department is quite active, and in many cases deliveries are said to be considerably behind, but there may be a chance to catch

up during the coming month. There is a large amount of work on hand, however, and prospects are said to be very favorable for the remainder of the year. Prices are well maintained as follows for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—The demand is good and mills appear to get plenty of work, consequently prices are firm at the rates fixed two or three weeks ago. Some little falling off in the demand has been expected, but so far reports continue to be favorable. Quotations for seaboard and nearby deliveries are as follows: Iron Bars, 1.55c. to 1.60c.; Steel Bars, 1.62½c. to 1.70c., delivered.

Sheets.—There is no let up in the demand for thin Sheets, and anything like prompt deliveries appear to be out of the question at the present time. Prices are therefore very firm and hardly quotable except in a general way, as everything depends on time for delivery. The following figures are probably as near to the market as can be given for best Sheets (common Sheets two-tenths less): No. 10, 2.50c.; No. 14, 2.70c.; No. 16, 2.90c.; Nos. 18-20, 3.40c.; Nos. 21-24, 3.50c.; Nos. 26, 27, 3.65c.; No. 28, 3.75c. to 3.80c.

Old Material.—Dull and easier, particularly for Steel, which is said to be easily 50c. below last week's prices. Bids and offers are about as follows for deliveries in buyers' yards: Choice Railroad Scrap, \$18 to \$19; Country Scrap, \$16 to \$17; No. 2 Light Scrap, \$12.50 to \$13; Machinery Cast, \$13.50 to \$14; Heavy Steel Scrap, \$15.50 to \$15.75; Old Iron Rails, \$19 to \$20; Old Steel Rails, \$15 to \$15.25; Wrought Turnings, \$11.50 to \$12; Cast Borings, \$8 to \$8.50; Old Car Wheels, \$17.50 to \$18; Iron Axles, \$21.50 to \$22.50; Steel Axles, \$17 to \$18.

Cleveland.

CLEVELAND, OHIO, June 18, 1901.

Iron Ore.—The demand for Iron Ore, and the desire to furnish it, has become so great that the movement now is unprecedentedly heavy. A slight indication of this was seen last week in this port alone when the receipts amounted to 162,000 tons. This was 22,000 tons heavier than the largest receipts at any one like period in the history of this port. The question which presents itself now as a knotty problem is the ability of the docks to handle this Ore as fast as the ships bring it down. While the tonnage has been greatly increased no additional dock facilities have been afforded. Already the inability of the docks to handle this Ore has been demonstrated, and evidence are found in congested conditions in all ports, and frequent and long delays to boats. In the end this may result in a curtailment of the movement of Ore to some extent, at least the conditions will take the edge off of the appetite of some of the ship owners for cargoes, with the inevitable result that the freights will be weakened. No such change is evident at this time, for the market is firm at the old figures, but it is admitted in all circles that the owners are fortunate to have found employment for most of their vessels at the contract figures rather than wait for the wild rates. The present going freights are 80c. from the head of the lakes; 70c. from Marquette, and 60c. from Escanaba.

Pig Iron.—The market is listless, yet expectant. The uncertainty as to conditions beyond July 1, and the desire to have the stock piles pretty well cleaned up at the time of invoice, is preventing any great amount of business being done. Some small lots of Foundry Irons are being sold for immediate delivery, upon which the old prices prevail of \$14.50 for No. 1, Valley furnace, and \$14 for No. 2, Valley furnace. Most of the consumers have provided against their needs pretty well into July and some few even after that time, although no general buying for the third quarter has been done. All indications apparent now are that the business will be brisk after July 1, but until things are a little more settled than at present few hope for any big orders. Basic is practically off of the market for immediate delivery. A sale is made now and then at \$15, Valley furnace, but the tonnage is not large. The sales also are light for

the third quarter, due to the fact that most of the big orders have been placed. The United States Steel Corporation have laid in their supply for the third quarter, and are not buying for the fourth as yet. Other consumers are following this example. The same price, \$15, Valley furnace, prevails for the third quarter. All are looking now for the establishment soon of the price of \$15.25, Valley furnace, for Bessemer by the big order of the United States Steel Corporation, but it has not come yet.

Finished Material.—During the last week the Carnegie Steel Company closed with the American Ship Building Company for 1200 tons of Plates and 600 tons of Shapes. This was the first order upon the new ships, which are to be built as soon as the berths are empty. The recent sales have also included 1200 tons of Shapes, especially for agricultural work; and 800 tons of Rails. The latter were purchased by George T. Bishop for the Dallas, Fort Worth & Southern Electric Line. The demand for Angles is extraordinary. It is now impossible to obtain deliveries short of two to three months, according to the state of the mills at which application is made. Beams and Channels up to 12 inches are also in good demand, the supply having been exhausted for from two to three months ahead. The same grades over 12 inches are more plentiful, although the mills are not begging for business. On Bars the best that can be done is to make deliveries in three months. The demand for them has been so heavy that the plants have become congested. On Plates, in addition to the new orders placed, the specifications are coming in heavily. Billets are in good demand. The prices remain as follows: Beams and Channels, 1.70c.; Plates, 1.70c.; Bars, 1.50c.; Rails, \$28; Billets, \$24.

Old Material.—The demand for Old Iron is better now than it has been, although the tendency to drop the price of Bessemer Pig to \$15.25 has had a weakening effect upon the prices. The dealers are still demanding the same old scale of prices, refusing to do business at a less figure. Prices have not settled down to a basis where they may be quoted.

Birmingham.

BIRMINGHAM, ALA., June 17, 1901.

If one judged the condition of the market by the actual transactions, there is no change in it. It has been, and it continues to be, dull and lifeless. But there is a ray of light visible, as inquiries the past week were very materially increased. But whatever hopes they may have inspired were disappointed, for they did not result in any new business. The sales made were of no significance in volume, and were confined mainly to the ordinary run of orders. Some Pipe interests were in the market feeling its condition, but no agreement was reached on prices, and consequently no business was done. Sellers are not disposed to make any lower prices than now prevail. With the average price now obtained for Iron the margin of profit is rather slim. Quotations are in the same condition as has been reported of late. Grades in fair supply are quoted at full market by holders, while those that they cannot offer have a relatively lower rating. Gray Forge sold the past week at \$9.40, while quotations on it run all the way from \$9.50 to \$9. But those who quote it at \$9 have none in stock. Holders of that grade are very reluctant sellers below \$9.50. And No. 4 Foundry is in about the same fix. There were some sales at \$9.50, and none reported below that price. No. 2 Foundry sold at \$10.50, and no seller will admit a sale below that price. No. 3 Foundry is quoted at \$10. Take it all in all, the market is an unsatisfactory one to both sides. There are some large requirements to be filled in the near future for the last half of the year, and the knowledge of this gives some confidence to sellers in the future of the market. In finished production there continues a fine demand. In the crude form only is there dullness. The rolling mills are going at full tilt, running both night and day, and some of our shops are doing the same. In Steel we can only repeat the

good reports that have been previously made. There is a ready market for the output, and at prices much more satisfactory than obtains for Pig Iron.

The Republic Iron & Steel Company will place their Steel mill here in commission again as soon as it can be done. Probably in ten days it will be turning out Steel.

Changes continue to occur in the Tennessee Company. The resignation of G. B. McCormack, who has so long filled the office of general manager of that company, has been accepted. His successor is Chas. McCreery, who has been connected with the Duquesne Iron Company of Pennsylvania, and is at present manager of the Dominion Iron & Coal Company. The change is to occur July 1.

One furnace at Oxmoor is in process of being dismantled, and the machinery is being transferred to the Ensley plant for use there. In process of time another furnace at Ensley will be erected. In fact, it has come to the ears of your correspondent that at least three additional furnaces will be erected at Ensley. There are rumors among pretty well posted people of very important additions to be made to the industries at Ensley. Among them is a large rolling mill, a Tin Plate mill and a Steel Structural plant. It can only be said that they are in an embryotic stage so far. Negotiations are pending concerning other industries which, so far, give every promise of ending favorably. The policy of the Tennessee Company seems directed to a concentration of their interests as much as possible at Ensley. A great deal of interest is being taken in affairs there by some powerful influence. The report that the Tennessee Company have an option on the Alabama Steel & Wire Company is vigorously denied by the officials, but it has credence here.

St. Louis.

1205 CHEMICAL BUILDING, June 17, 1901.

Pig Iron.—The market has been rather quiet during the last two weeks and dealers do not expect the buying movement to begin before July 1. Contracts made during the first four months of the year expire in July and new orders will necessarily have to be placed at that time. While the market has been dull on the whole, one Malleable concern bought about 2000 tons of Malleable Iron, and one or two orders of 500 tons of special Iron are reported. We quote carload lots as follows, f.o.b. St. Louis:

Southern, No. 1 Foundry.....	\$14.50 to \$14.75
Southern, No. 2 Foundry.....	14.00 to 14.25
Southern, No. 3 Foundry.....	13.50 to 13.75
Southern, No. 4 Foundry.....	13.00 to 13.25
No. 1 Soft.....	14.75 to 15.00
No. 2 Soft.....	14.25 to 14.50
Gray Forge.....	12.25 to 12.50

Bar Iron.—While the demand for Bar Iron is not up to the standard of last month it continues to be good. Jobbers are not placing many orders at present, as the farmers are busy and not buying much, but there is plenty of business in sight and the outlook is all that could be wished for. Mills quote Iron Bars at 1.55c. to 1.60c., and Steel Bars at 1.60c. to 1.65c. Jobbers quote Iron Bars, 1.85c. to 1.90c.; Steel, 1.95c. to 2c., full extras.

Rails and Track Supplies.—A steady demand continues for Rails and Track Supplies, but no large sales are reported. Mills are having considerable difficulty in making anything like prompt shipment, and a much larger business could be done if early shipments could be guaranteed. Prices are firm at: Splice Bars, 1.80c. to 1.90c.; Bolts, with Square Nuts, 2.45c. to 2.55c.; with Hexagon Nuts, 2.80c. to 2.85c.; Spikes, 1.90c. to 1.95c.

Pig Lead.—The market here is quite firm, with a big demand for Soft Missouri at 4.27½c.; choice brands, 4.30c. to 4.32½c. Chemical is at a premium of 7½c. to 10c., as there is a scarcity of that description.

Spelter.—There is a good demand for Spelter, and very little in the market unsold, but no change in price is looked for at present. Sellers ask 3.80c. to 3.82½c.

Pittsburgh.

HAMILTON BUILDING, June 19, 1901.—(By Telegraph.)

Pig Iron.—The Pig Iron market, which has been in somewhat unsatisfactory condition for some time, has been greatly improved by the purchase of 50,000 to 75,000 tons of Bessemer Iron by United States Steel Corporation, mostly for June and July delivery. The purchases of this interest have been so large that they have created a shortage in supply of Bessemer Iron, and the market for this and next month is very strong at \$15.25, Valley furnace, which was the price United States Steel Corporation paid for their Iron. It is a fact, however, that some of the furnaces in consideration of these contracts, will place orders for Coke with the leading Coke interest for the last six months of the year. There is no doubt but that United States Steel Corporation will need additional tonnage in Iron, and further contracts may be placed at any time. An Eastern Steel concern have also bought a round lot of Bessemer Iron for delivery commencing June and running through the third quarter. Altogether more than 100,000 tons have been bought, and the market is considerably improved. Other small consumers of Bessemer Iron are figuring on purchases which may be made at any time. Forge Iron is in a little better demand, but prices are weak. For a round lot for forward shipment \$13 at Valley furnace, or \$13.75, Pittsburgh, could be done. Small lots of Forge for June and July have sold at \$13.25, Valley furnace, or \$14, Pittsburgh. Consumers of Foundry Iron are pretty well covered through third quarter, and there is very little buying. Prices are weaker than they have been for some time. We quote: Bessemer, \$15.25, Valley furnace, or \$16, Pittsburgh, for June and July delivery; Forge, \$13 to \$13.25, Valley, or \$13.75 to \$14, Pittsburgh; No. 1 Foundry is \$15 to \$15.25; No. 2, \$14.50 to \$14.75, and No. 3, \$14 to \$14.25, all f.o.b. Pittsburgh. We note a sale of about 1000 tons No. 2 Foundry Iron at a price equal to about \$14.50, Pittsburgh.

Billets.—The Steel market is very firm and small lots of Billets for prompt shipment are selling at \$24.50 to \$24.75 at makers' mill. On steel for delivery over balance of the year it is probable \$23 to \$24, makers' mill, could be done. The pool price on Billets has never been advanced over \$19.75, Pittsburgh, Wheeling or the Valleys, but owing to heavy demand the price has been anywhere from \$24 to \$25 at makers' mill, depending on deliveries wanted. Sheet and Tin Bars are held at \$1 a ton above the price of Billets, which would make them \$25.50 to \$26 for prompt delivery.

(By Mail.)

Ferromanganese.—Foreign Ferro is being offered in this market at low prices. Recently a representative of a German maker of Ferro canvassed this market very thoroughly and offered 80 per cent. Ferro at \$53.50, delivered, f.o.b. cars Pittsburgh, for carload lots and larger amounts. An Eastern concern representing an English maker are offering 80 per cent. Ferro in this market at \$53.90, f.o.b. cars Pittsburgh, in lots of 200 tons and over. The local producer of Ferro is holding 80 per cent. at \$55 in carload lots, delivered.

Structural Material.—If the Wabash Railroad get an entrance into Pittsburgh, a Steel bridge of the cantilever type will be built across the Monongahela River at the foot of Ferry street to the south side. Preliminary plans are being drawn for this bridge, and it is said it will require about 8000 tons of Steel. No large work has recently been placed, but there is a good run of small orders. We may state that some low prices are being made by contractors putting up Iron and Steel structures. Both local mills are very busy, and the output of Structural Steel at the Homestead Steel Works last month was the heaviest in any one month in the history of the plant. There is no change in prices, and we quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.40c. to 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

Muck Bar.—There is a very active demand for Muck

Bar, due to the fact that buyers expect a shutdown of the mills on July 1 for repairs, which may be prolonged considerably should there be any trouble in reaching a settlement of the wage scales. Most of the large makers of Muck Bar are using nearly their entire product, and this adds to the scarcity. We note sales of 2500 to 3000 tons of Standard grade at \$28.50, delivered, f.o.b. cars Pittsburgh.

Steel Rails.—A few small orders are being placed. The local mill is practically out of the market as a seller of Rails for balance of this year. We quote Standard Sections at \$28 at mill.

Plates.—New tonnage being placed with the mills is light and there is complaint that specifications on old contracts are not coming forward as freely as desired. However, most of the large mills are well filled up for the next two or three months, but some of the smaller concerns are going after Plate orders more aggressively than for some time. We are advised that fixed prices are being firmly held. We quote: Tank quality, ¼-inch and heavier, 1.60c.; 3-16-inch, 1.70c.; under 3-16-inch and above No. 10, 1.75c.; Flange or Boiler Steel, 0.1c. advance over the base of Tank; Marine and Fire Box, American Boiler Manufacturers' Association specifications, 0.2c. advance over Tank; Still Bottom Steel, 0.3c. advance over Tank; Locomotive Fire Box Steel and equivalent specifications, 0.5c. advance over Tank, all f.o.b. Pittsburgh.

Sheets.—It is almost impossible to get prompt delivery of Sheets at any price. The mills are sold up away ahead, while the leading interest are not promising deliveries inside of 60 to 90 days, or longer. This is particularly true of Galvanized Sheets, demand for which seems to be larger than for Black. There is no change in prices, and we quote: No. 27 Black Sheets, box annealed, one pass through cold rolls, 3.20c. to 3.25c.; No. 28, 3.30c. to 3.35c. There is a heavy demand for Galvanized Sheets, and for prompt delivery they sometimes bring a slight advance over regular prices. We quote at 70 and 10 per cent. off, f.o.b. maker's mill.

Bars.—As noted last week, some of the Steel Bar mills have pretty well cleaned up old contracts and are going after new tonnage in a way that would indicate they are badly in need of specifications. The fixed price of 1.40c. for Steel Bars is being made by some of the mills on single carload lots. We quote Steel Bars at 1.40c., at mill, half extras. In small lots an advance is charged. On Open Hearth Steel Bars \$2 a ton advance is charged and also extras on high carbons. All prices on Steel Bars are f.o.b. Pittsburgh, with freight added. We quote Common Iron Bars at 1.45c., half extras, at Valley mill. We quote Hoops at 1.85c., base, for carload lots. Bands up to 12 gauge are sold on the Steel Bar card, and we quote at 1.40c., half extras.

Merchant Steel.—New tonnage is light and some of the mills have few orders ahead. Buyers are purchasing only small lots, believing prices will not be any higher, and may possibly be lower. We quote: Tire Steel, 1.60c.; Toe Calk, 1.85c.; Open Hearth Spring, 2c.; Plow Slabs, 2c.; Tool Steel, 6c. and upward, depending on quality. On Tool Steel freight is allowed.

Skelp.—The fact that the Tube mills are so well filled up gives the mills rolling Skelp all they can do. There is a heavy demand, and prices are firm. We quote Grooved Iron Skelp at 1.82½c. to 1.85c., maker's mill, according to size. Sheared is held at about 1.90c. to 2c., for very wide or very narrow sizes. Steel Skelp is about \$2 a ton lower than Iron.

Tubular Goods.—Tonnage being placed in Tubular Goods is larger than the mills can turn out. For this reason some sizes of Pipe are scarce. Very heavy shipments of Tubular Goods of all kinds continue to be made by Pittsburgh mills to the Texas oil fields. Prices are firm, and in small lots to consumers are as follows:

Merchant Pipe.		
	Per cent. Black.	Per cent. Galvd.
½ to ¾ inch and 11 to 12 inch.....	61	48
¾ to 10 inch.....	68½	56

Casing, Random Lengths.		
	S. & S.	I. J.
2 to 3 inch.....	58	53½
3¼ to 4 inch.....	63	59
4¼ to 12½ inch.....	65	61½
Casing, Cut Lengths.		
	S. & S.	I. J.
2 to 3 inch.....	53½	59
3¼ to 4 inch.....	59	55
4¼ to 12½ inch.....	61½	57½
Boiler Tubes.		
		Up to 22 feet.
Steel.		Per cent.
1 inch to 1½ inch and 2¼ inch to 5 inch, inclusive....		65½
2 inch to 2½ inch, inclusive.....		60
6 inch and larger.....		59
Iron.		
1 inch to 1½ inch and 2½ inch.....		43½
1¾ inch to 2¼ inch.....		43
2½ inch to 13 inch.....		53

Prices made by the mills to the jobbers are from 5 to 10 per cent. lower than the above.

Coke.—Some contracts for Furnace Coke have been made within the past week on an exchange basis for Pig Iron. Output of Coke in the Connellsville region has fallen off considerably, and last week was about 210,000 tons, a decrease over the previous week of more than 15,000 tons. Strictly Connellsville Furnace Coke is held at \$1.75 to \$2 a ton, at oven, the leading Coke interest holding firmly for the higher price. Main Line Furnace Coke is being offered at low prices in certain markets in competition with Coke made in other districts, and which have an advantage in freights. We may state that some brands of Furnace Coke have been offered for prompt shipment as low as \$1.50 a ton. The general market is \$1.60 to \$1.75 a ton. Strictly Connellsville Foundry Coke is held at \$2.25 to \$2.50 a ton. Main Line Foundry Coke is held at \$2 to \$2.25 to consumers.

Cincinnati.

FIFTH AND MAIN STS., June 19, 1901.—(By Telegraph.)

The change in the Pig Iron situation during the past week has been very slight. For the first five days the record of the preceding week was duplicated. The past two days, however, brought some customers in the market for low grade Irons. This made things a little more lively. These customers, however, had their minds pretty well made up as to the price they would pay, and it is believed they succeeded in landing their goods on the basis of \$9, Birmingham, for No. 4. A sale of 2000 tons of Southern Foundry No. 3 was made on the basis of \$9.50, Birmingham. Other sellers quote sales of No. 4 and Gray Forge on the basis of \$9.50. General quotations, however, are not given out on the low basis just quoted, but are as given herewith. And at this list the market is by no means strong. The outlook is for a continuance of the quiet season, though it can hardly be as dull as it has been in the recent past. Activity will be at the expense of the price-list, however. Freight rate from Birmingham is \$2.75 to this point; from Hanging Rock district, \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$13.75 to \$14.00
Southern Coke, No. 2.....	13.25 to 13.50
Southern Coke, No. 3.....	12.50 to 13.00
Southern Coke, No. 4.....	12.00 to 12.25
Southern Coke, No. 1 Soft.....	13.75 to 14.00
Southern Coke, No. 2 Soft.....	13.25 to 13.50
Southern Coke, Gray Forge.....	12.00 to 12.25
Southern Coke, Mottled.....	12.00 to 12.25
Ohio Silvery, No. 1.....	15.50 to 16.00
Ohio Silvery, No. 2.....	14.50 to 15.00
Lake Superior Coke, No. 1.....	15.00 to 15.25
Lake Superior Coke, No. 2.....	14.75 to 15.00
Lake Superior Coke, No. 3.....	14.25 to 14.75
Southern Basic.....	14.00 to 14.75

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades.....	\$18.25 to \$18.75
Standard Southern Car Wheel, No. 2.....	17.25 to 17.75
Lake Superior Car Wheel and Malleable.....	18.50 to 19.00

Plates and Bars.—The situation seems stronger, with a slight promise of higher figures soon. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.60c., with half extras; same in small lots, 1.80c., with full extras; Steel Bars, in carload lots, 1.55c., with half extras; Base Angles, in carload lots, 1.80c.; Plates, ¼-inch and heavier, 1.80c.; Sheets, No. 16, 2.50c.

Old Material.—The market is quiet and the basis of trading not materially changed. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, per net ton, \$15; Cast Railroad Machine

Scrap, \$12.25 to \$12.75; Iron Axles, \$18.75 to \$19; Iron Rails, \$16.75 to \$17.25; Steel Rails, rolling mill lengths, \$14.75 to \$15.25; short lengths, \$13.75 to \$14; Car Wheels, \$15.75 to \$16.25. All prices except No. 1 Wrought on the basis of gross tons.

New York.

NEW YORK, June 19, 1901.

Pig Iron.—Very little has been done in this market during the week. Locally, the machinists' strike is affecting a smaller and smaller number of foundries, and to that extent the situation has improved. We quote: Lehigh, Schuylkill and Virginia Irons, No. 1, \$16.50 to \$17.50; No. 2 X, \$15.25 to \$15.75; No. 2 Plain, \$14.25 to \$14.50; Gray Forge, \$14 to \$14.50; Tennessee and Alabama brands, No. 1 Foundry, \$15 to \$15.50; No. 2 Foundry, \$14.50 to \$14.75; No. 1 Soft, \$15 to \$15.50; No. 2 Soft, \$14.50 to \$14.75; No. 3 Foundry, \$13.75 to \$14; No. 4 Foundry, \$13 to \$13.25; Gray Forge, \$13 to \$13.25.

Steel Rails.—Some foreign inquiries are coming to hand, but none of the mills can touch the business. During the past week business has been offered for next year, but nothing has been done as yet. We quote \$28 for Standard Sections, \$32 to \$32.50 for Girder Rails, and \$22 to \$23 for Relays. We quote Spikes, 1.80c. to 1.85c.; Splice Bars, 1.45c. to 1.50c.; Square Track Bolts, 2.35c. to 2.40c., and Hexagon Bolts, 2.45c. to 2.50c., at mill.

Finished Iron and Steel.—Only a moderate amount of business is coming up. The American Bridge Company during the past week have taken orders aggregating 9500 tons, the largest being for the ore bins, inclines, &c., of the Ore handling plant for the new Buffalo works of the Lackawanna Iron & Steel Company. We quote as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.80c. to 1.85c. for Tank, 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange, and 3.25c. for Fire Box. Refined Bars are 1.57c. to 1.60c.; Soft Steel Bars, 1.62½c. to 1.65c., and Hoops, 1.90c. to 2c., base, on dock.

The Crucible Steel Company of America announce that from July 1 the sales departments of the constituent companies at their several offices and warehouses will be conducted under the name of the Crucible Steel Company of America. The chief office is in the Empire Building, Pittsburgh; the Eastern and export office at 71 Broadway, New York, and the London office at 110 Cannon street, E. C., London.

Metal Market.

NEW YORK, June 19, 1901.

Pig Tin.—There was a sharp decline since our last writing, the market reaching the lowest yesterday with 27.50c to 28c. for spot, but closing somewhat higher today with 28.15c. to 28.35c. Late futures are very weak, September to-day being quoted 27.25c. to 27.40c. Business during the entire week was very dull. In the face of the big discount on futures consumers are only buying from hand to mouth. The London market has declined daily until yesterday, when spot reached £127 10s., but a reaction set in to-day which advanced prices fully £1 higher for spot. The closing quotations to-day were £128 10s. for spot and £123 for futures. A discount of over £5 will be noticed. The half monthly shipments from the Straits amounted to 2340 tons, as against 1680 tons for the same period of last year. This is a further increase of 660 tons, bringing the total increase in the Straits shipments this year to 2706 tons.

Copper.—Was very dull, with no quotable change in prices. The prices quoted are 17c. for Lake and 16½c. for Electrolytic and Casting Copper. It is said in the trade that Electrolytic is being shaded considerably in a quiet way. The London market declined until Monday, when spot reached the low point of £68 16s. 3d.,

but it has since reacted a little, and closed to-day at £69 1s. 3d. for spot and £69 10s. for three months' futures. Best Selected is unchanged, at £74 15s. Exports up to the 18th inst. aggregated 5042 tons, which is a falling off from last month and a heavy decrease as compared with the same period of last year, when the exports for June amounted to 15,599 tons.

Pig Lead.—Prices are unchanged, but business has quieted down a good deal. The American Smelting & Refining Company quote 4.37½c. for Desilverized, New York, and 4.32½c., St. Louis. Exports from here are said to be heavy. The London market is a shade higher, with £12 7s. 6d.

Spelter.—This market is extremely dull, with prices practically unchanged. Spot is quoted 3.95c. to 4c., but shipments are freely offered at 3.95c. St. Louis is dull at 77½c., and the London market has declined to £17 7s. 6d.

Antimony.—There has been no change in this market; prices are steady at 8¾c. for Hallett's and 10¼c. for Cookson's.

Nickel.—Is firm and unchanged at a basis of 60c. for lots not covered by yearly contract.

Quicksilver.—Is unchanged. Prices quoted are \$51 per flask of 76½ pounds for lots of 50 flasks and more. London quotations are unchanged, the market being £9 2s. 6d.

Tin Plate.—There is a good business at unchanged prices. The scarcity of Plates for immediate delivery is becoming rather emphasized. The American Tin Plate Company quote on a basis of \$4.19 per box of Standard 100 pound Cokes, f.o.b. New York, and \$4 per box, f.o.b. mill, for deliveries until October 1.

John Stanton reports the Copper production in the United States and of the foreign reporting mines and United States exports as follows, in gross tons of 2240 lbs.:

	Reporting mines.	Outside sources.	Total U.S. product.	Product foreign mines.	U. S. exports.
First half 1895....	70,612	9,100	79,712	42,484	34,215
Second half 1895....	84,855	6,600	91,455	43,674	30,507
Total 1895.....	155,467	15,700	171,197	86,178	64,722
First half 1896....	94,180	7,200	101,380	42,255	58,216
Second half 1896....	95,314	7,200	102,514	43,941	67,287
Total 1896.....	199,494	14,400	203,894	86,196	125,503
First half 1897....	103,651	5,000	108,651	44,263	64,870
Second half 1897....	100,555	6,900	107,455	44,007	64,340
Total 1897.....	204,206	11,900	216,106	88,270	129,210
First half 1898....	112,687	7,800	120,487	40,880	68,284
Second half 1898....	103,535	10,250	113,785	43,674	70,551
Total 1898.....	216,222	18,050	234,272	84,554	145,115
First half 1899....	111,987	12,500	124,487	43,629	58,460
Second half 1899....	118,818	18,900	137,719	45,611	63,351
Total 1899.....	230,806	31,400	262,206	89,240	119,811
First Half 1900....	114,177	20,400	134,577	43,153	90,747
Second half 1900....	113,810	20,400	134,104	46,278	69,335
Total 1900.....	227,987	40,800	268,681	89,431	160,082
January, 1901.....	19,279	3,400	22,679	5,910	10,003
February, 1901....	17,700	3,400	21,100	7,332	8,453
March, 1901.....	19,984	3,400	23,384	7,817	6,818
April, 1901.....	18,038	3,400	21,438	8,810	4,849
May, 1901.....	18,892	3,500	22,392	10,062

The Molders' Demands.

A dispatch from Cleveland states that the chances for a repetition of the molders' strike in that city seem very favorable, and it is possible that it will be much more far reaching than the nine months' hold out of the molders in that city last year. The molders are demanding a horizontal increase of 25 cents per day; from \$2.75 to \$3.00 for ten hours' work.

A meeting of the Cleveland union molders was held June 14 to decide on the strike proposition. It was decided to wait ten days to see if the manufacturers would not grant their demands. If no concessions are made in that time a strike is very likely to come. The above decision is the result of a conference held June 13 at Cleveland between representatives of the National Foundrymen's Association and the Molders' Union. The following were present at the conference: Representing the National Foundrymen's Association: President W. H. Hoyt of New York, T. L. Thornton of St. Louis, Antonio Pressana of Philadelphia, James Reed of Westfield, Mass., and John Briggs of Minneapolis, Minn. Representing the Molders' Union: President Martin Fox of Cincinnati, Vice-President F. M. Vanentine of San Francisco, M. J. Murphey of Richmond, Va.; James

Flanigan of Elizabeth, N. J., and James Block of Cincinnati. The conferees adjourned without reaching an agreement, the foundrymen declaring that they could not go above the terms of the old agreement, which placed the pay of the molders at \$2.75.

At Chicago a conference was held on the 14th between the committee of the local founders and a committee of the molders. They were not able to come to any agreement, but instead of parting without any attempt at a settlement, they decided to submit the question at issue to an Arbitration Committee of the National Founders' Association and of the National Molders' Union of America. Representatives of these bodies will meet in Chicago on the 24th inst. Until then it may be said that the question of a molders' strike will be held in abeyance.

The Colorado Fuel & Iron Company.

Reports have been circulated in very positive form that the United States Steel Corporation, or financial interests back of it, have purchased control of the Colorado Fuel & Iron Company. It is stated that there has been offered in exchange for each share of the common stock of the Colorado Company one share of common and one share of preferred United States Steel stock. All who are close to the management of both corporations profess to be ignorant of any such negotiations, and the statement is made that the true facts are really known by only one man, J. Pierpont Morgan, now in Europe. In the trade the whole transaction is discredited, because it is not believed likely that the United States Steel Corporation would to-day purchase at what is an extravagant price a company who do not now play an important part in its territory, even in the rail trade. So far as the wire plant to be built is concerned, it is not of as early or pressing interest as other outside concerns located in the heart of the consuming district. Nor is the encouragement which such a purchase would give to new enterprises a negligible factor.

St. Clair Furnace Company.

PITTSBURGH, PA., June 19, 1901.—(By Telegraph.)—The St. Clair Furnace Company have broken ground for their three new blast furnaces, which they are to build at Clairton, in Monongahela Valley. The stacks will probably be 90 x 20 feet in size and they will be equipped with Massicks and Crookes hot blast fire brick stoves, for which George W. McClure & Co., engineers and contractors, Smith Block, Pittsburgh, have the contract. There will be 12 of these stoves and it is one of the largest contracts placed for a long time. All the iron work will be done by the Ritter-Conley Mfg. Company, while the Wilson-Snyder Mfg. Company of Pittsburgh have been given the contract for the pumping machinery. The Westinghouse Electric & Mfg. Company will build the generators for the electric plant.

PERSONALS.

Allan W. Wood of the American Sheet Steel Company has gone abroad.

George Lander of the Carnegie Steel Company, Pittsburgh, has sailed for Europe.

J. Armstrong Rawlins of Naylor & Co., New York, has started on a six weeks' trip to England.

Walter C. Stone has been made superintendent of the Rankin Works of the American Steel & Wire Company, succeeding George Nash, who has gone with the Pittsburgh Steel Company. August Mann, formerly assistant at the Braddock Works of American Steel & Wire Company, has been made superintendent.

The offices of the Oliver Iron Mining Company were removed on Thursday, June 20, from the Carnegie Building, Pittsburgh, to Duluth. Almost the entire force of officials and clerks were taken in special cars, and the new offices at Duluth are expected to be in good working order on Monday, June 24.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING JUNE 19, 1901.

Cap'l Issued.		Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.	Closing quotations.	Sales.
\$10,000,000	Am. Bicycle Co., Com.....						- 4½	4½	300
20,000,000	Am. Bicycle Co., Pref.....								
10,000,000	Am. Bicycle Co., Bonds...								
29,000,000	Am. Car & Foundry, Com.	33¼-34¾	33¼-35	33¼-33¾	33 -34	32½-33¼	32 -33¾	32¾	110,600
29,000,000	Am. Car & Fndry, Pref. §.	86½-87½	86½-87¾	87¼-87½	87½-88¼	87½-88	87 -87¾	87½	11,500
7,500,000	Bethlehem Iron.....	-63	-63	-63	-63	-63			275
15,000,000	Bethlehem Steel.....	-23¼	-23	-23					500
7,974,550	Cambria Iron, Phila.*.....	-49			-48½	-49			120
16,000,000	Cambria Steel**.....	31¼-31½	31 -33	25½-27½	27½-28	27½-28½	27½-27¾	27¾	69,513
17,000,000	Colorado Fuel & Iron...	108½-116½	116½-127½	128 -133	132¼-136½	123 -133	112 -127	114	48,300
24,410,900	Crucible Steel, Com.....								
24,399,500	Crucible Steel, Pref.....								
1,975,000	Diamond State Steel§§..	3¾- 4	3¾- 4	3½- 3¾	3¾- 3¾	3¾- 4	- 4		4,424
15,000,000	International Pump, Com.		40 -41	-40	39¾-40	39¾-41¼	41 -41¾	41¾	3,400
12,500,000	International Pump, Pref.	-82¼	-82½	-82½	82 -82½	-82½			1,500
11,000,000	International Silver.....		-82½	7½- 7½	7½- 8½	8½- 8½	7½- 8½	7¾	4,600
10,750,000	Penna., new, Com., Phila.	50 -51	-51½			-50			546
16,500,000	Penna., new, Pref., Phila. §	88½-89½	89 -90		89 -89¼	89 -89½			1,572
12,500,000	Pressed Steel, Com.....	45 -45½	45 -45½	-44½	45 -46	44½-45½			5,800
12,500,000	Pressed Steel, Pref.....	85½-86½	86 -86½		86½-87	86 -86½	85½-86½	86	2,300
27,191,000	Repub. Iron & Steel, Com.	20 -20½	20 -21¼	20½-20¾	20¾-24	22¼-23¾	21½-22¾	22	88,900
20,306,900	Repub. Iron & Steel, Pref.	76½-77	74½-75½	74½-75	74½-78	76 -77½	75½-76½	75¾	16,900
7,500,000	Sloss-Sheffield S. & I. Com.	38 -39	38 -38¾		38½-39	37½-38	36½-37	36½	2,200
6,700,000	Sloss-Sheffield S. & I., Pref. §	81¼-83			-83		-82½	82½	600
20,000,000	Tennessee Coal & Iron...	63 -66½	64¼-69½	66½-69	69¼-76½	71¼-76½	67¼-72½	68½	197,200
1,500,000	Tidewater Steel.....	- 7½				- 7½			800
506,473,400	U. S. Steel Co., Com ...	48½-49¼	49¼-49¾	48½-49¾	48¾-49¾	48¾-50	48½-49½	49½	228,600
508,486,300	U. S. Steel Co., Pref. ...	98 -98½	98½-99½	98½-98¾	98¾-99¼	98¾-99½	98¾-99½	99	71,900
1,500,000	Warwick I. & S. 	- 7¼	7¼- 7¼						130

Cambria, ex-dividends, sales, 13,215 shares; Warrants, 178,550; Cash, 4,100.

Preferred stocks 7% cumulative unless otherwise stated. § 7% Non-Cu. §§ New stock. | Par \$10. || Par \$50. §1 paid in. || Authorized Capital \$50,000,000 Common; \$555,000,000 Preferred; * Par \$50. ** \$10.50 per share paid in. † 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph.

Bonded Indebtedness: American Bicycle Co., \$10,000,000 sinking fund gold debentures 5%; Cambria Iron Co., \$2,000,000 6% debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Diamond State Steel Co., property leased from Diamond State Steel Co. at 4% on \$1,000,000, \$6.25 on Steel stock paid in, \$1.25 called for June 1st, total capital \$2,000,000; Tennessee C. I. & R. R. Co., \$8,867,000 6%, \$1,114,000 7%, \$1,000,000 7% cu. pref.; Pennsylvania Steel, \$1,000,000 5% Steelton 1st, 1917, \$2,000,000 5% Sparrow's Point 1st, 1922, \$4,000,000 consolidated, both plants; Bethlehem Iron, \$1,851,000 5% maturing 1907, interest and principal guaranteed by Bethlehem Steel Co.; Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co., Col. Fuel Co. Gen. Mort. 6% \$860,000, Col. Coal & Iron Co. Mort., 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,808,000, also outstanding \$2,000,000 preferred stock; Sloss-Sheffield St. & I. Co., Sloss I. & S. first mortgage 6%, \$2,000,000, Sloss I. & S. general mortgage 4½% \$2,000,000. U. S. Steel Corporation \$304,000,000 5% gold bonds, also Am. S. & W. Co. \$130,656, Federal Steel Co. \$9,822,000 Illinois 5%, \$7,417,000 E. J. & E. R. R. 5%, \$1,600,000 Johnson 6%, \$6,732,000 D. & I. R. R. 5%, \$1,000,000 2d D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel \$2,561,000 6%.

Iron and Industrial Stocks.

The street has been filled with rumors of acquisitions on the part of the United States Steel Corporation of the controlling interest in the Colorado Fuel & Iron Company and the Tennessee Coal, Iron & Railroad Company. The former stock at one time rose as high as 136½, but dropped back until it closed to-day at 114. Tennessee stock, too, had its rise, but held it relatively well. The only justification for the latter is that an option has been secured on the property of the Alabama Steel & Wire Company, a large mill adjoining the Ensley Steel plant of the Tennessee Company, which furnishes it with Steel Billets under a long time contract. Philadelphia has had its principal sensation in the enormous dealings in Cambria rights and stock.

	Bid.	Asked.
E. W. Bliss, common.....	145	152
E. W. Bliss, preferred.....	130	140
Cramp's Shipyard stock.....	81½	85
Dominion Iron & Steel Company.....	35½	32
Empire Iron & Steel, common.....	6	8
Empire Iron & Steel, preferred.....	33	40
National Enam. & St., common.....	23½	25
National Enam. & St., preferred.....	87	90
New Haven.....	4½	4¾
Otis Elevator, common.....	31	32
Otis Elevator, preferred.....	93	94
Pratt & Whitney, preferred.....	85	90
U. S. Cast Iron Pipe Company, common.....	7½	8
U. S. Cast Iron Pipe Company, preferred.....	38	39
U. S. Projectile.....	119	
Va. C. I. & C., stock.....	8¾	
Va. C. I. & C., bonds.....	50	51
H. R. Worthington, preferred.....	110	115

The directors, respectively, of the Bethlehem Steel Company and of the Bethlehem Iron Company, at a special joint meeting, arranged to call a meeting of the Bethlehem Iron Company stockholders for August 15, at South Bethlehem, and of the Bethlehem Steel Company stockholders August 16, at Philadelphia. It is understood that the stockholders at these meetings will be asked to approve the sale of both properties.

There has been placed on the unlisted department

of the Philadelphia Stock Exchange Drexel & Co.'s receipts for deposits of Cambria Steel stock, \$13.50 paid.

Dividends.—The directors of the George A. Fuller Company, New York, have declared a dividend on their preferred stock at the rate of 7 per cent., payable on July 1. Thorwald Stallknecht was elected a director to succeed Thomas E. Butler.

The National Enameling & Stamping Company have declared the regular quarterly dividend of 1¼ per cent. on their preferred stock, payable June 30. Books close June 20 and reopen July 1.

The Empire Iron & Steel Company have declared a dividend of 1½ per cent. on the preferred stock, payable July 2 to stockholders of record June 22.

The Standard Coupler Company have declared the regular semi-annual dividend of 4 per cent. on their preferred stock, payable July 1.

The American Smelting & Refining Company have declared the regular quarterly dividend of 1¼ per cent. on their preferred stock, payable July 9. Books close June 22 and reopen July 10.

The Susquehanna Iron & Steel Company have declared a semiannual dividend of 3 per cent., payable July 2.

Westinghouse Electric & Mfg. Company have declared a regular quarterly dividend of 1¼ per cent. on the various preferred stocks, payable July 1.

The Union Switch & Signal Company of Pittsburgh have declared a regular quarterly dividend of 1 per cent. on the common and 2 per cent. on the preferred stocks, payable July 10. The failure of the directors of the Union Switch & Signal Company to increase the dividends was a distinct disappointment to the street. It has been known that a part of the earnings has been devoted to the completion of extensions at the company's plant, but aside from this no reason is forthcoming why the company should longer withhold their large earnings from the stockholders. The Westinghouse companies have all been run conservatively and

with a view to accumulating a surplus for needed improvements and extension of business, and it is plain that the policy is not to miscarry in Switch. It is also made plain by such action that the company are not catering to any patronage for the stock in the market, and that the erstwhile speculator need look for no encouragement from that source.

The Westinghouse Air Brake Company of Pittsburgh have declared a regular dividend of 2½ per cent. and an extra dividend of 3½ per cent., payable July 10.

The New York Machinery Market.

NEW YORK, June 19, 1901.

A slight improvement in conditions is reported. Demand is, however, still rather slack. A most agreeable feature of the situation is the excellent disposition being shown by purchasers where merchants are unable to make deliveries owing to the machinists' strike. Where the tools ordered are required urgently the purchasers are satisfied to take substitutes furnished by the dealers which are made by concerns not affected by the strike. For instance, one dealer carries two lines of lathes, one made in Cincinnati and another in New England. The Cincinnati shop is closed down on account of the strike, and where orders have come in for Cincinnati lathes, the dealer has been able to fill them with the New England product. These New England shops, which are not affected by the strike, are thus reaping a harvest now.

Warehouses of machinery dealers in this city are beginning to fill up again with the product of shops not affected by the strike. There have been no announcements of changes in prices during the week.

About the only order of individual importance or size was placed last week by the newly organized Colonial Steel Company of Pittsburgh. It was for ten large steam hammers and went to Manning, Maxwell & Moore. This concern will furnish the Chambersburg hammer.

It is again reported that the new list of the tools to be purchased by the Central Railroad of New Jersey for their new Elizabethport shop will be completed this week and decided upon immediately afterward. The new list will be a considerable increase above the one issued several months ago.

The C. W. Hunt Company of Staten Island have purchased the engines to be installed in their new central power station, which was built last year and equipped with the exception of the engine end. It is reported that the Harrisburg Foundry & Machine Company captured the order.

The Fuel Economizer Company of 74 Cortlandt street and Matteawan, N. Y., have received an order for economizers to be installed at the works of Auger Simon & Co., Paterson, N. J. The latter concern are enlarging their power plant and are also about to purchase additional boilers. Contracts have been awarded for the new coal storage plant to be built by the Lowell Gas Company of Lowell, Mass. The contract for the building was awarded to the Riter-Conley Mfg. Company, and the order for the conveying machinery and mechanical appliances was awarded to the C. W. Hunt Company. The plant will have a capacity of 25,500 tons.

The Guggenheim Exploration Company are purchasing machinery for a new smelting plant to be built by the Federal Lead Company at Flat River, Mo. Contracts for a stand pipe, crusher house, engine house and head-gear were awarded to the Riter-Conley Mfg. Company.

The latter concern also received orders from M. Guggenheim's Sons for fume condensers and a steel stack, 19 feet 6 inches in diameter by 160 feet high, which are to be erected at the smelter owned by the Guggenheim Company and located at Aguas Calientes, Mexico.

The Ruggles-Coles Engineering Company of 39-41 Cortlandt street, have received orders for drying plants from the Gray & Bunce Portland Cement Company of Owen Sound, Ontario, the Imperial Portland Cement Company and the Buckley Lime Company of Toledo, Ohio, and the Granite Wall Plaster Company of Port Clinton, Ohio.

OBITUARY.

NOTES.

JOHN A. GOODYEAR, master mechanic at the Cornwall furnaces, Lebanon, Pa., died suddenly on June 14, aged 60 years.

SIR ANDREW FAIRBAIRN, head of the great engineering firm of Fairbairn, Naylor, Macpherson & Co., of Leeds, England, died recently in London, aged 73 years.

Proposed Consolidation of Roll Makers.—PITTSBURGH, PA., June 19, 1901.—(By Telegraph.)—For some time past a movement has been under way to consolidate into one company the interests of the Frank-Kneeland Machine Company and the Lincoln Foundry Company of Pittsburgh and the Lloyd Booth Company of Youngstown, Ohio. These concerns are makers of rolls and rolling mill machinery, the product of the three different concerns being practically identical. We may state that the plan to consolidate these three concerns into one company has progressed far into being practically assured. Only the above three concerns will be consolidated at first, but it is probable that other plants in the Pittsburgh district and elsewhere that are making rolls will be taken over later.

Among recently licensed corporations of Illinois are the McCloud Company, Chicago, with a capital of \$200,000, to manufacture and contract for cast and wrought iron pipe, fittings, valves and wrought iron bands. The incorporators are P. R., S. J. and W. J. McCloud. This business was formerly operated under the name of S. J. McCloud, but it was enlarged and the capital increased, and it was deemed desirable to incorporate. The company have a large plant at Fulton and Jefferson streets, Chicago, and have recently opened another on Staten Island, N. Y., where they have very good dock and railroad facilities. The New York plant is a brick structure, 200 x 300 feet, and comprises a machine, bending and pipe shop. Plans are now being considered for the establishment of an office in London.

About 30 of the 150 employees of the A. & F. Brown Company of Elizabethport, N. J., have returned to work under former conditions, and the company are arranging to obtain outside help so as to get the plant in operation as soon as possible.

Officials of the Tin Plate Workers' International Protective Association have advised officials of the American Tin Plate Company that they will be ready to hold a conference on the tin house workers' scale on June 20, and suggest that the meeting be held in Cleveland. The new scale for tin house labor calls for an advance of about 15 per cent.

What is said to be a record feat in wireless telegraphic communication was made recently when a message was received on board the battle ship "Hector" of the British Navy at Portsmouth from the naval authorities at Portland, England, the distance being 103 miles in a direct line.

Some important experiments in connection with a new telegraph system have recently been conducted by the British postal engineers between London and Glasgow. The new apparatus is the invention of a French engineer named Mercadier, and by its means it is possible to send 12 separate messages over one wire at the same time. The system is also capable of being duplexed, by which 24 separate messages can be sent at one time over a single wire.

The American Can Company have appointed Charles A. Suydam, formerly connected with the Norton Tin Plate & Can Company, Baltimore, Md., as sole selling agent for Packer's Cans in the territory embracing New Jersey, New York and New England, with headquarters in the Bowling Green Building, New York.

HARDWARE.

RECENT events have borne out the anticipations of thoughtful observers that one of the results of the consolidations of the iron and steel interests would be a maintenance of prices at critical times, with the natural result of a generally steady, uniform market. But for the control thus exercised it is quite certain that there would have been a different story during the temporary depression of last fall when doubt and distrust of the future were general, and the common expectation was of declines as rapid and sudden as had been the advances. Had there been a host of manufacturers disunited and discordant as in the past, it cannot be doubted but that the experience of the past would have been repeated. It contributed greatly to the maintenance of values that at a critical moment strong interests in practical control of the market held matters steady till the business interests could take fresh courage and make their purchases without fear of serious loss.

Later on, when the enormous demand became fully developed, there was, with a few notable exceptions, the same conservatism displayed in not advancing prices in face of the almost irresistible temptation to do so. Every unprejudiced observer knows that for the past three months it would have been very easy for manufacturers in certain lines to have obtained much higher prices than have prevailed, as it has been entirely a question of getting goods. The control of the market for raw material has had a marked influence on manufacturers of Finished Material entirely outside the province of the consolidated interests, and the result has been a steadiness, which has come in good part from a similar conservatism. It, of course, would be futile to fight against general conditions, and to endeavor to maintain prices in an artificial way; but by timely conservatism we have apparently been saved from a disastrous decline at one period and an equally disastrous boom at another.

We are now slowly but surely approaching a period when a different course of action may be both wise and necessary, and when the great consolidations may be further called upon to prove their right to existence by reducing prices in a judicious manner to meet existing conditions. While there may be no immediate sign of this, nor of the necessity for it, those critics who have declaimed that these large aggregations exist only for the purpose of extorting unusual profits may yet find that they have reckoned without their host, and that concentrations of men and capital have added a new chapter to economical production. The full results of this in possibly cheapening raw material and thus permanently establishing this country's manufacturing supremacy remain to be seen.

The meeting of the Independent manufacturers of Shovels, which will be held this week at Cleveland, is significant. When it is remembered that the withdrawal from the market of several concerns which during past years threatened to be formidable competitors of the associated manufacturers was secured by purchase, subsidy or otherwise, so as to leave the combination in practical control of the situation, the number of new enterprises now in the field is a striking commentary on the persistency of competition. It is understood that

the associated manufacturers will not subsidize any other factories, realizing that such encouragement to capital and enterprise is no longer wise or profitable. The success up to the present time of the Shovel association is an evidence of the ability with which its affairs have been conducted, and whatever may be the final outcome, there is no doubt that the manufacturers have reaped handsome profits. The goods which are being put on the market by outside manufacturers are not as yet materially affecting the association control, but there are increasing evidences that the present condition of things cannot longer continue. The trade will await with interest the development of events, and the retail merchants especially regard with satisfaction the probability that the present high prices, which call for so much apology and explanation on their part, are not likely to hold indefinitely.

Condition of Trade.

With the advance of the season there is a relaxing of the demand for goods. Travelers are beginning to come home. The trade generally are recognizing that a quiet time is at hand. There is still a free movement of manufactured products and manufacturers are receiving many orders, mostly to fill up holes in the stock. Contracting for future delivery is not especially active. Prices generally are quite firmly maintained. Manufacturers and merchants are in most cases glad to have a respite from the exacting demands of business for the past few months and the vacation period will be entered upon very generally with becoming zest after the application and success of the half year's business. Existing conditions, too, are regarded as especially satisfactory. The outlook for trade is on the whole excellent. Export business, notwithstanding the cutting off of markets here and there for certain kinds of products, is of greater total volume than ever before. The railroads are doing a large and profitable business. Enterprises of all kinds are being undertaken. Building, especially through the country, is active. There is employment for practically all who care to work. Money is abundant, collections on the whole are good, and the people are prosperous. There does not appear to be reason to apprehend in the near future a reaction from these exceedingly favorable conditions.

Chicago.

(By Telegraph.)

The demand for Hardware, although not quite so heavy as earlier in the month, is very good, running much in excess of the corresponding month last year. Jobbers have not yet found a sufficient shrinkage in their orders to dispense with night work. Their forces are still obliged to put in two to three nights a week. The excellent condition of business is shown by the continued receipt of heavy mail orders. Dealers are not inclined to order by mail unless they are in immediate need of the goods thus ordered. The condition shows some variation from the usual summer experiences. Summer goods are not in as active demand as in past years. This is ascribed to the late appearance of warm weather. Second orders should be coming in very freely by this time. Any falling off in this direction is more than made up by the extraordinary demand for Builders' Hardware, Mechanics' Tools and other small goods which are easier to handle and more agreeable to sell than the bulky summer goods. The movement of shelf goods has been so large this year that in no case have jobbers been able to measure their requirements in placing advance orders. They have consequently been obliged to replenish their stocks frequently. The scarcity in many lines of goods heretofore noted continues

to be a feature. Wire Nails are being shipped more promptly, but in other classes of Wire products the shortage continues. Manufacturers of Tinware have not been able by any means to make up enough goods to satisfy the requirements of the trade. It is less a question of price on such goods at present than how to supply the articles called for. Heavy Hardware jobbers also report a trade running much in excess of the corresponding month last year and keeping well up to the excellent record made in April and May. They likewise report much difficulty in securing sufficient quantities of goods to satisfy their trade. A particularly heavy demand is noted just now for manufactured Iron and Steel on account of the approaching shut down of the mills. The experience of last year is still fresh in the minds of many consumers.

St. Louis.

The condition of the Hardware trade continues very active and the demand, if anything, above that of the week previous. Wire goods continue to be scarce and the orders far in excess of the supply. There is very little prospect in the shortage of goods in this line being relieved. There is a large demand for Bolts and a corresponding scarcity. Jobbers handling Binder Twine report a sudden increase in orders and inquiries. Builders' Hardware is in strong demand, also Tools of all kinds. Prices are steady, showing very little, if any, variation either one way or the other. Orders for the fall trade are coming in satisfactorily, and the volume and the general conditions of trade are such as to make the outlook for business promising.

Baltimore.

CARLIN & FULTON.—The cool and wet weather of April and May have kept back both the crops and trade dependent upon them, and now that we have had a touch of summer the effect is shown in the increase of orders, especially from the near trade.

In the agricultural sections the marketing of fruit and early vegetables is putting considerable money in circulation, and we are glad to hear that prospects are excellent for a good wheat crop, the good results of which will be shown in the fall.

Prices of goods seem not only well maintained by the manufacturers, but quotations on many commodities are being gradually advanced.

The demand for Barb Wire is considerably less than a few weeks ago; still the inability of the factories to supply it promptly seems as great as ever, and it is thought that as the stocks in dealers' hands must be very light the factories will be kept busy clear through the entire summer.

We regret to notice what seems to be a cloud of large proportions on the business horizon—viz., the impending trouble with labor. In view of the possibility of a general suspension of work until the differences between capital and labor are adjusted, it would seem to us good policy for the trade to keep their stocks well supplied with all seasonable and staple goods for which there is an inevitable demand, and in obtaining which there is too generally a disposition to wait until the last minute. The trade have had an experience in this line last year with Loaded Shells and with Chains, and this spring in Barb Wire and many other articles, and the possibilities are that this fall with only an ordinary demand for goods there is going to be great difficulty in getting prompt deliveries.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The month of June is usually one of the dullest in the year, but this season it is proving to be much better than the average. The salesmen on the road report their friends, the retailers, to be in good shape, and the nice, well assorted orders being sent in seem to verify these statements.

The demand, just at present, for Hay Forks, Hay Carriers, Binder Twine and other harvesting goods is very large, and the stocks in these lines are about exhausted. There has also been a tremendous business

done in Refrigerators, Water Coolers, Freezers, Wire Cloth, Lawn Mowers, and orders for them continue to come in. Evidently the people intend to be comfortable this summer and have the money with which to buy such hot weather luxuries.

The credit men of the different houses seem to be in good spirits, and report their departments in a very satisfactory condition.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—This writing shows us at about the end of the spring season for active trade. More or less trade will continue now for the next two weeks, but during the month of July there is a lull in trade circles. The business of the past six months, however, we feel shows an increase of trade over the same six months of 1900. Business as a whole has been satisfactory, prices with isolated exceptions have been firmly held, failures have been comparatively few and collections have been fair. In the latter it is safe to say there has been an improvement over the first six months of last year.

The outlook is good for fall trade.

Louisville.

W. B. BELKNAP & Co.—Business seems if anything on the improve. There has been somewhat of a lull incident to planting and farming operations generally and also incident to the strikes in the cities. These latter seem to be on the road to adjustment, the carpenters' or builders' strike here being amicably compromised during the past week. In fact, there was not much ground for it in the first place. It was kept up mainly by professional agitation.

There is plenty of work to be done and steady employment assured, unless hindered by just such ill timed interference from outsiders as we have seen in this case.

The demand for all classes of goods is well maintained; money is abundant, and at the same time in good demand, and the general outlook promising.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—The last month of the first half of the year is holding well up to its predecessors in volume of business. If the second half of the year does as well as the first, we shall be well satisfied.

We have been handicapped so far in June by cold, cloudy and rainy weather, even snow in some parts of the State, a condition very unusual for this section in June. So far no serious damage to grain or fruit crops is reported, but we cannot stand much more of it.

Collections do not improve, nor can we expect them to until we can realize on some of our fine prospects.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—Business conditions have been favorable this month, and trade has been very satisfactory. Crop prospects are fine, and the demand for goods is likely to continue active. The shortage of goods in some lines has been severely felt, and there is a lack of promptness in filling orders by a considerable number of manufacturers. This has been the most disturbing factor the past three months, and probably will be for some time ahead.

NOTES ON PRICES.

Wire Nails.—The demand for Wire Nails continues good. Shipments from mill are now made with more promptness, but there is still some complaint among jobbers on this score. Quotations remain unchanged, as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.30
To jobbers in less than carload lots.....	2.35
To retailers in carload lots.....	2.40
To retailers in less than carload lots.....	2.50

New York.—The trade tributary to this point are ordering a fair quantity of Wire Nails, but not quite as many as is expected at this season. Small manufactur-

ers who are making a limited assortment of Nails are offering concessions from jobbers' prices. This does not affect the general market, which is firm at the following quotations:

To retailers, carloads on dock.....\$2.53
Small lots at store..... 2.60

Chicago, by Telegraph.—The leading manufacturers of Wire Nails report the continued receipt of good orders. They are now enabled to make fairly prompt shipments, but are not yet accumulating stocks to any serious extent. They report that from the present outlook they will go into July with as much tonnage booked for all classes of Wire products as at any time in the past four months. The Nail and Wire trade has probably never before experienced such a long continued demand. Jobbers find the trade keeping up very well. Almost every order includes some Wire Nails. Carload lots are quoted at \$2.45, and small lots at \$2.55, with a concession to \$2.50 to best buyers.

St. Louis.—Jobbers report a good demand for Wire Nails from all classes of customers, and there is no trouble in getting prompt shipments from the mills. Jobbers quote carload lots to retailers at \$2.55, base, and less than carload lots at \$2.60 to \$2.65, base.

Pittsburgh.—Demand for Wire Nails at the present time is smaller than it has been for some months. This is due to the usual summer dullness in trade. There is no trouble now in getting prompt deliveries of Nails of any size, and reports are that some of the smaller trade are shading established prices. The Hartman Mfg. Company, at Ellwood City, have started their Wire Nail mills and will soon be turning out close to 4000 kegs per day. The Sharon Steel Company, at Sharon, have been entering orders for Wire Nails for some time. Their mills, however, will not be started before July, or perhaps later. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....\$2.30
To jobbers in less than carload lots..... 2.35
To retailers in carload lots..... 2.40
To retailers in less than carload lots..... 2.50

Cut Nails.—The situation in the Cut Nail market is without change, demand being fair. The market is represented by the following quotations, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....\$2.00
Less than carload lots.....\$2.05 to 2.10

New York.—The requirements for Cut Nails in the local market are moderate. New York quotations for carload and less than carload lots are based on the above prices, to which Pittsburgh freight has been added:

Carload lots on dock.....\$2.13
Less than carload lots on dock..... 2.18
From store..... 2.25

Chicago, by Telegraph.—The Cut Nail situation shows practically no change. The demand is steady. Jobbers quote small lots from stock at \$2.35.

St. Louis.—Requirements for Cut Nails are fair. Jobbers quote small lots at \$2.30 to \$2.35, base.

Pittsburgh.—We note a fair demand for Cut Nails, and the mills claim that fixed prices are being better held than for some time. Demand for Iron Nails is on the increase, as many buyers prefer these to Steel Cut Nails. The market is represented by the following quotations, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....\$2.00
Less than carload lots.....\$2.05 to 2.10

Barb Wire.—The falling off in the demand for Barb Wire naturally expected at this season has not occurred. The mills are running full time, and stocks in the hands of the trade throughout the country generally are limited. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....\$2.60
To jobbers in carload lots, Galvanized..... 2.90
To jobbers in less than carload lots, Painted..... 2.65
To jobbers in less than carload lots, Galvanized.... 2.95
To retailers in carload lots, Painted..... 2.70

To retailers in carload lots, Galvanized..... 3.00
To retailers in less than carload lots, Painted..... 2.80
To retailers in less than carload lots, Galvanized... 3.10

Chicago, by Telegraph.—It is surprising to know that the factories have not yet caught up with their orders. Buyers have visited this city from far Western points hoping to be able to secure some Barb Wire from the local jobbers, but without success. The country seems to be absolutely bare of this class of material. Carload lots are quoted at \$2.75 for Painted and \$3.05 for Galvanized. Less than carloads are quoted at \$2.85 and \$3.15, respectively, with a shading of 5 cents to the best trade.

St. Louis.—There is practically a famine in the Barb Wire trade at present. Jobbers are behind on orders and can see no way out of these conditions, as it is impossible to get stock from the mills. The market is very firm and there is no change in prices. Jobbers quote carload lots of Painted at \$2.85 and Galvanized at \$3.15. Less than carload lots are quoted at \$2.95 for Painted and \$3.25 for Galvanized.

Pittsburgh.—The mills are running to full capacity to meet the heavy demand for Barb Wire, which has characterized the market for some time. For domestic trade we quote: Galvanized Barb Wire, \$2.90 in carload lots to jobbers, and Painted, \$2.60. Terms, 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

Plain Wire.—A large quantity of Plain Wire is being turned out by the mills, who find it difficult to keep up with their orders, especially on the heavier gauges. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes.	
	Plain.	Galv.
To jobbers in carload lots.....	\$2.25	\$2.65
To jobbers in less than carload lots.....	2.30	2.70
To retailers in carload lots.....	2.35	2.75
To retailers in less than carload lots.....	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances.

Nos.	Base.	Galvanized.
6 to 9.....	Base.....	\$0.40 extra.
10.....	\$0.05 advance over base.....	.40 "
11.....	.10 " " " ".....	.40 "
12 and 12½.....	.15 " " " ".....	.40 "
13.....	.25 " " " ".....	.40 "
14.....	.35 " " " ".....	.40 "
15.....	.45 " " " ".....	.75 "
16.....	.55 " " " ".....	.75 "
17.....	.70 " " " ".....	1.00 "
18.....	.85 " " " ".....	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—The Wire mills are still overburdened with business and the largest manufacturers are fully three weeks behind in making deliveries, particularly on sizes running heavier than 14 gauge. The extraordinary demand for Fencing continues to be given as the explanation for this condition of affairs. Carload lots are quoted at \$2.40, base, and small lots from stock at \$2.50, with \$2.45 quoted to the best trade.

Pittsburgh.—Demand continues heavy and the mills are turning out and shipping a larger tonnage of Wire than ever before. The market is firm and for domestic trade we quote:

	Plain.
To jobbers in carload lots.....	\$2.25
To jobbers in less than carload lots.....	2.30
To retailers in carload lots.....	2.35
To retailers in less than carload lots.....	2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

Binder Twine.—Demand for Binder Twine throughout the Central West is active. Manufacturers are reported as quoting Standard Twine at 8 cents per pound, and Manila at 9 cents, with a partial freight allowance. Jobbers are quoting Standard at 8 to 9 cents and Manila at 9 to 11 cents. In the Eastern market Sisal and Standard Twines are quoted at 8½ cents per pound, with ¼-cent rebate in carload lots, although some manufacturers are asking ¼ cent per pound more. Manila is quoted

at 10¼ cents per pound, and Pure Manila 11¼ cents, with rebate of ¼ cent per pound in carload lots.

Glass.—The scale of wages to be paid Glass workers for the fire beginning September 15, 1901, and ending May 15, 1902, is somewhat of an increase over that previously in effect. The local market shows no improvement in demand. Jobbers' quotations for domestic Glass continue without change, as follows:

	Discount.
Less than car lots, from store.....	.80 and 20 %
Carloads, f.o.b. factory.....	.85 and 5 %
3000 boxes, f.o.b. factory.....	.87 %

These prices are for single or double strength, and cover the entire country.

Paints and Colors.—**Leads.**—There is an active demand for White Lead in Oil, covering immediate requirements. No change has been made in the price of Leads as a result of recent advances in Linseed Oil quotations and of the stiffening of the Pig Lead market. Should either or both of these make further advances there is a possibility of higher prices of Lead products. Quotations of White Lead in Oil are as follows: In lots of 500 pounds and over, 6½ cents; in lots of less than 500 pounds, 7 cents per pound.

Oils.—**Linseed Oil.**—On June 18 an advance of 4 cents per gallon was made in the price of Linseed Oil, as a result of the management of the American Linseed Company passing into the hands of the Standard Oil interests. The American Company have practically controlled the out of town Oil market for some time, as they have been selling Raw Oil at 59 cents per gallon, both for immediate and future delivery. Independent mills have been unwilling to meet this price. Quotations are as follows, in 5-barrel lots and over: City Raw, 65 cents; out of town Raw, 63 cents per gallon. For less than 5-barrel lots 1 cent advance. Boiled Oil is 2 cents advance per gallon on Raw.

Spirits Turpentine.—Owing to a stronger Southern market local prices for Turpentine have advanced. Demand is moderate and is confined to small lots. Quotations are as follows, according to quantity: Southern, 37 to 37½ cents; machine made barrels, 37½ to 38 cents per gallon.

Correspondence.

"THE JOBBER A NECESSITY."

To the Editor: In your last issue I noted with interest the discussion at the Southern Hardware Jobbers' Association concerning the eradication of the middleman and the picturesque explanation of the matter given by a prominent official connected with one of the consolidations.

But what's the use of discussing the matter? Haven't the officials of the consolidations been told often enough that the jobber is a necessity? True it is the jobber himself who has supplied this information, but is there a better authority? Has not the jobber been in business long enough to know that he is a necessity? Like Emperor William, aren't they here by divine right?

Has the retailer or the manufacturer ever reflected on what would happen if the jobbers of the country should suddenly decide to get out of business and join the army in the Philippines or engage in an expedition to Mars? The poor manufacturer would have to give up making goods and find a new field for his endeavors. The wretched retailer would have to go fishing. The Hardware business would be at a standstill. And all this because the consumer, hearing the jobber had departed, would stop buying goods! It is a terrible thing to contemplate.

AJAX.

Jennison Hardware Company, Bay City, Mich., wholesale and retail Iron and Steel, Heavy Hardware, and Mill, Mine and Factory Supplies, have increased their capital stock from \$40,000 to \$100,000. The company have built another warehouse and added 100 feet to their river front.

Hardware Organizations.

MICHIGAN RETAIL HARDWARE DEALERS' ASSOCIATION.

The Executive Committee of the Michigan Retail Hardware Dealers' Association met at the Hotel Cadillac, Detroit, on the 12th inst., with the following members present: H. C. Minnie, vice-president, Eaton Rapids; Henry C. Weber, treasurer, and Fred. H. Cozzens, secretary, of Detroit; C. E. Pipp, Otsego; A. J. Scott, Marine City; A. Harshaw, Delray; Robt. G. Chandler, Coldwater, and John Popp, Saginaw, members of the Executive Committee. In the absence of Geo. W. Hubbard, Flint, president, who was unable to be present, Vice-President Minnie occupied the chair and called the meeting to order.

The secretary's financial report showed receipts since the last convention, \$979.62; disbursements, \$662.12; balance in bank, \$317.50. Twenty-six new members have been taken in since the last convention, and it is expected that between 50 and 100 more will join at the next meeting.

After a general discussion of the matters before the body, the secretary was instructed to arrange a programme with the following speakers: W. P. Lewis, New Albany, Ind., president of the National Retail Hardware Dealers' Association, on the subject of "National Association Work;" R. G. Chandler, Coldwater, Mich., on "The Best Methods of Running a Hardware Store;" H. C. Weber, Detroit, on "Store Window Dressing and Keeping Stock in Good Shape." "The Collection of Accounts" will be handled by Mr. Cleland, attorney of the Commercial Credit Company, Detroit.

It is planned to hold the second day's session at Rushmere Club at the Flats, the party leaving Detroit on the fast steamer "Tashmoo" at 9 o'clock in the morning, reaching the Rushmere Club at noon, holding the afternoon session there, and returning in the evening and reaching Detroit about 9 o'clock. It was thought that this would provide recreation and at the same time give ample opportunity for the transaction of unfinished business from Wednesday's afternoon session. The first session of the convention will be at the Hotel Cadillac, where the headquarters of the convention will be, on Wednesday, August 14. This meeting will continue as late as necessary in the afternoon, and it will be planned to dispose of all other business at the afternoon session at the Flats. It is possible that a session may be held on the "Tashmoo" in the morning going up, if it is found necessary.

A number of practical discussions on the advantages of association work and on the National Association will come up in the Question Box topics, so that every dealer who comes may be assured of a helpful, dollar bringing meeting, and at the same time be assured of sufficient entertainment in the shape of boat rides, &c., to make it desirable to come and bring his wife and children.

An unusually large attendance is anticipated, as the meeting was postponed from July until August on purpose to meet the needs of the country dealer, who finds it difficult to get away in July.

NEW ENGLAND IRON AND HARDWARE ASSOCIATION.

THE annual meeting of the New England Iron and Hardware Association was held, by courtesy of ex-President Harry L. Doten, at the Exchange Club, Boston, Tuesday evening, June 18. As usual, the dinner was preceded by an informal reception. At 6 o'clock, about 50 members and guests gathered around the board and enjoyed an excellent repast. At the close of the banquet President Chamberlain announced the end of the fiscal year and called upon Clerk John T. Boyd for his report, which was comprehensive and interesting, showing the association to be in a flourishing condition. The membership of 100 is filled and the entire capital stock held.

In order, therefore, to increase the membership it will be necessary to increase the capital stock, the association being a Massachusetts corporation with a charter giving it a wider scope than charters usually granted purely social organizations.

Following Mr. Boyd, the treasurer, C. H. Breck, presented his report, which showed a comfortable balance in the treasury.

Reports of Committees.

Mr. Breck also reported for the Credit Bureau Committee, and this important branch of the association work was announced to be in a very satisfactory condition. During the past year the collection department handled accounts aggregating \$60,000, and was successful in collecting a large percentage of this with small expense. The Bureau of Credit is divided into three departments—namely, collection, attorneys, and bankruptcy and assignment. The commissioner having these departments in charge is E. L. Haley, formerly in the wholesale Hardware business in Boston, who is familiar with the details of the business and the *personnel* of the trade.

E. P. Sanderson, chairman of the Membership Committee, reported that 33 new members were admitted during the year, so that the membership is now 100 active and seven associate members.

Allan J. Chase, chairman, reported for the Heavy Hardware Committee. The clerk read the Shelf Hardware Committee report, prepared by Wm. Chamberlain. The next report was that of the metal trades section, given by P. E. Strauss. The Wooden Ware, Saddlery Hardware and Paint and Oil committees did not report.

After some discussion regarding a proposed increase in the capital stock of the association in order to provide for new members, this matter was postponed to the September meeting.

Election of Officers.

The president then called for the report of the Nominating Committee, which recommended the election of the following: For directors, Allan J. Chase, Chas. H. Breck, John T. Boyd, Oscar A. Shepard, E. P. Sanderson, Henry A. Robbins, H. W. Waite, James A. Munroe, Charles W. Henderson, Jr.; Chas. H. Breck, treasurer; John T. Boyd, clerk.

The directors then met and elected Allan J. Chase as president and Oscar A. Shepard as vice-president.

President-elect Chase was conducted to the chair and addressed the company, expressing appreciation of the honor shown him and gracefully complimenting the association upon its aims and accomplishments.

Retiring President Wm. Chamberlain then addressed the association as follows:

Mr. Chamberlain's Remarks

I want to congratulate you on the very prosperous condition of your association at the close of the eighth year of its existence. In retiring from the office to which you so kindly called me, I want to impress on each member the importance of individual work, as well for the good of the association as for the special departments, and call your attention to the possibilities it offers. That your membership is a benefit I think each will concede, but that you do not receive all you might is due to yourselves. Each one must do his part and give time and thought to the work. Your officers, be they ever so zealous, cannot do it all; they must receive your cordial support. Give this and give it generously; be willing to work for the common good and the returns will be greater than from any investment of your time that you make.

I want to thank each one for your kindness and forbearance with me during my term of office, and especially the directors and other officers for their uniform courtesy and hearty support. I know under the able leadership of your newly elected officers your progress will be greater than in any previous year. Again I thank you for the great confidence you placed in me, and assure you I shall always remember with pleasure the many pleasant experiences of the past year.

At the close of his address Mr. Chamberlain was given three hearty cheers. The meeting then adjourned.

SHOW WINDOW DISPLAY.

The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.

HARDWARE STORE WINDOW DISPLAY.

BY W. C. M'LEAN.

PART FIRST.

The show window offers great possibilities of gain to the enterprising Hardware merchant. It is the best salesman and the best advertisement at his disposal. It draws no weekly salary; it sends no monthly bills. The show window, if properly utilized, takes thought and time. The time, however, is not an important item, for show window work can and should be done at times when clerks are not otherwise employed.

A POOR WINDOW SUGGESTS FAILURE TO USE RESOURCES.

The sight of an illly dressed Hardware window makes a progressive Hardwareman feel as though the proprietor of the store was not doing his level best, not utilizing all his resources to make a success. This feeling is strengthened when, on entering the store, some of the employees are found lounging around and swapping yarns, when they might be dressing the window.

If that employer, the writer would have his clerks take turns trimming the window, and offer a prize for the best trim, basing judgment upon both the opinions of rank outsiders and on the relative financial return to the outlay. If brought to feel the importance of the subject, the proprietor might enter the lists himself, at least to show the "boys," as he does in other ways, how it should be done.

Some merchants may think that they already devote all the energy and time that they ought to window dressing. In these latter days competition is getting so sharp that every available means to increase trade must be used.

THE COMPETITION OF THE HARDWARE DEALER.

By a careful compilation of names from last year's directories of the Hardware dealers in eight States—two Eastern, two Northern, two Southern and two Western—and assuming that an average of statements from these States would fairly represent that of the whole country, we find that five-sixths of the Hardware stores have local competition; one-half have more than one competitor, and one-fourth of the total number are located in what might be called cities—i. e., places of over 5000 inhabitants. The following table shows the number of Hardware stores in the eight States selected, the number in towns or cities of over 5000 population, the number in towns containing three or more Hardware stores, and the number in towns containing two stores:

State.	Dealers.	In towns having 5,000 population.	In towns with three or more stores.	In towns with two or more stores.
Indiana	1,029	232	479	776
Georgia	169	60	73	121
Delaware	43	11	25	33
California	475	178	303	383
Iowa	1,711	297	702	1,407
Alabama	117	33	60	84
Connecticut	129	86	81	99
Arizona	25	9	15	21
Total	3,698	906	1,738	2,924

Window trims that would be perfectly feasible for a city dealer might be impossible for a dealer in a small country town. In this paper, designed to aid as many dealers as possible, the effort has been made to arrange suggestions for displays so that they may be adapted to both the city and the country dealer.

SYSTEM IN WINDOW DRESSING.

Carry system into window dressing as you probably do in everything else. Manage to change your display at least once every two weeks. If you are in a town where dry goods and other stores change weekly, do likewise, for you should never allow anyone to get ahead

of you. If you are progressive, you will want to "set the pace" yourself, especially for your competitors. Nothing pleases one better than to get seasonable goods in a nicely dressed window and then watch the other fellows fall over themselves to get theirs in as soon as possible afterward.

At the beginning of the year the writer draws a chart with 52 spaces, each representing a week, assigning to each space a subject for a window trim. Certain of these heads are fixed, such as Independence Day, Christmas and New Year's. The others are liable to change by local conditions and the weather. Keep this chart in a note book, perhaps assigning a page for each subject, and whenever you come across an idea which you think might be worked into a trim, jot it down. Do not hesitate to adopt other people's schemes. Probably a little of your own thinking power will render the other fellow's idea more effective.

Keeping a permanent record from year to year guards against a repetition of trims. Customers have called attention to a trim as having been reproduced from more than a year back. A competition between clerks will also secure variety, even when the central idea, or *mottif*, as an artist would say, is the same. To have your window attractive is like putting your best foot forward.

CONSTRUCTION OF THE WINDOW.

The best show window has a floor not more than 2 feet up from the sidewalk. A front of about 14 feet can be obtained in a 20-foot store. If a store front is not very wide, it is far better to have one large window, with the entrance way at the side, as much more attractive and striking displays can be secured in one large than in two small windows. It is desirable to have the window as deep as possible, 10 feet being a good depth. Fig. 1

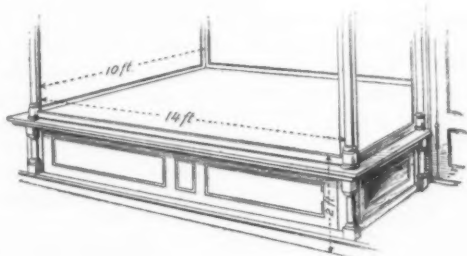


Fig. 1.—Shape of Window Suggested.

shows a window of these dimensions, a size well adapted to the average Hardware store.

LIGHTING THE WINDOW.

The best way to light the window artificially is a much debated question. The writer has found gaslight as furnished by Welsbach burners to be the cheapest and very satisfactory, because colors appear more nearly as by daylight. The fixture, Fig. 2, is a home made affair

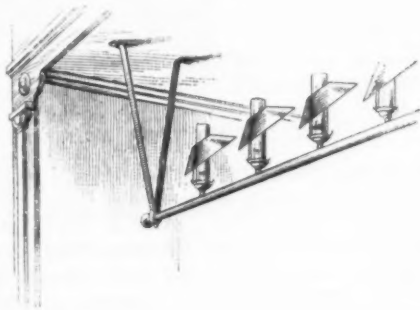


Fig. 2.—Arrangement of Welsbach Lights.

and consists of 1½-inch pipe (large, to equalize pressure) tapped every foot for a burner. This is suspended by brackets about 12 inches away from both front and side glasses and down from the ceiling about 2 feet. An aluminum bronze finish completes what every one calls a tasty fixture. If tin reflectors, mirrored on the inside, are used on the burners, the resulting illumination is

fairly dazzling. Using only every other burner when the store is closed for the day gives a light comparing well with any store on the street. This row of 11 Welsbach burners costs no more to run than did six fish tail burners, formerly used, and less than one-half what electric lights would cost.

Good results can seldom or never be secured by placing lights of any kind up and down the sides of the windows. The prospective customer is not tempted to look past the glass. The shadows cast by such lights do not show goods to the best advantage.

REFLECTION.

To get the fullest results from your trims you must reckon on the position of the window; whether or no it is on the shady or sunny side of the street. If you are on the sunny side of the street and you have to use an awning constantly, you will find reflection from the glass to be a great factor with which to deal.

Light backgrounds overcome reflection the most easily. Dark backgrounds will provoke you by throwing back very clearly to the ladies their likenesses, sought by their half turned faces as they walk down the street, and your pretty trim fails to attract them.

In the late fall, winter and early spring months, with their cloudy weather, the awning harassed merchant has an opportunity to use his darker backgrounds. Don't lower the awning any further than is necessary to protect your window. Being situated on the north side of an east or west street, and during the season when the use of the awning is imperative, the shadow cast by its outer edge so nearly approaches the vertical that the writer need never lower his awning more than one-third of the way to secure complete protection. The colors of the background must be well chosen or a mistake will be made and an effort that might be pretty be lost altogether.

AVOID A FLAT DISPLAY.

Observation has taught that one of the commonest mistakes in Hardware window trims is the placing flat on the floor any articles to be displayed. Seldom should anything be placed on the floor, and then only in front and next to the glass. Other articles behind those in front should be placed on steps, pedestals, &c. The ones furthest to the rear are placed highest up from the floor.

DO NOT OVERCROWD.

Another very common mistake is to place too many goods in the window at one time. In my schedule for a year's work I include not more than six or seven general windows. A "10-cent window" and a Christmas trim may be cited as good examples of general dressings. It has been said that one must not put too little "plunder" in a display. As to this, let it be said that one of the best trims the writer ever made had but one single article in it. A description of this display is given further on under the head of "A Base Burner Exhibit."

HAVE PLENTY OF SHOW AND PRICE CARDS

Lack of show and price cards is another mistake met very often. A window should attract the attention of the shopper and the cards are necessary to complete the mission of the trim and make the sale. Cards should talk for the proprietor. A complete description with illustrations of show and price cards that have been used with success is given in another part of this article.

HAVE THE GLASS CLEAN.

It seems a small matter to speak of, but not longer than three weeks ago the writer saw the prettiest dry goods window in town spoiled by a dirty glass. There is no excuse at all for any one not having perfectly clean, clear glass.

Striking and ingenious displays should be made with a view not only to draw attention of the passer-by, but should be made so striking that those on the opposite side of the street will make it a point to cross over and see the display. By this method a window increases greatly its advertising capacity and its selling power through cards, which if made the most of is very great.

WHAT TO DISPLAY.

The question is often asked, "What shall I display?" Anything and everything that you wish to sell. Un-

doubtedly one seeks to push profitable lines. Experience will soon settle the question, for a window will make profitable whatever is displayed properly

THE WINDOW AND NEWSPAPER ADVERTISING.

It is not necessary to have window displays made up of the articles advertised in the local papers. The window is a different medium altogether from the paper, and is not intended to reach the same people. Sometimes—on seasonable goods—they should correspond, but not often.

KEEP COSTS OF WINDOW.

Consider your window as an advertising medium and charge all cost of maintenance, lighting, kept by special meter, all accessories, and clerk hire used, to the advertising account.

BRAINS.

Before taking up displays in detail, emphasis should be laid on the necessity of giving thought to the subject of window display. Brains count for more in this branch of the business than in almost any other. Remember constantly that the mission of the window is to increase business. Give the window thoughtful attention and time. This cannot fail but secure pleasing and original displays that will yield a handsome return for all the effort invested.

(To be continued.)

BARGAINS FOR HARDWARE DEALERS.

THE Chicago House Wrecking Company, West Thirty-fifth and Iron streets, Chicago, have just issued their Catalogue No. 115 containing a confidential list of a great variety of merchandise such as is handled by the Hardware trade. The company state that this catalogue is sent exclusively to the legitimate Hardware trade and the quotations are strictly confidential. They offer the Hardwareman an opportunity through low prices to struggle with the department store and catalogue house evil. All the goods in this catalogue are new. The company, by paying special attention to sheriff's or receiver's sales secure goods at exceedingly low prices. The catalogue just issued presents an extensive variety of Hardware, consisting of Axes, Sledges, Hammers and other Steel Tools, Garden Tools, Wire Nails, Poultry Netting, Black and Galvanized Sheets, Roofing and Siding, Registers, Locks and other Builders' Hardware, Padlocks, Washing Machines, Meat Cutters, Scales, Circular and Cross Cut Saws, Emery Wheels, Blacksmiths' and Horse Shoers' Tools, Portable Forges, Harness Hardware, Belting, Gas Ranges, Bicycle Sundries, Wrenches, Pipe Vises, Kitchen Sinks, Radiators, Enameled Iron Lavatories, &c.

L. S. STARRETT COMPANY.

THE employees, 280 in number, of the L. S. Starrett Company, Athol, Mass., were pleasantly surprised several weeks since by receiving a circular, announcing that, beginning with June 1, 54 hours, nine hours a day, would constitute a week's work, instead of 60 hours as formerly, without reduction in pay. This action was not taken at any suggestion or demand from the employees, for they had not received even a request from them in regard to the matter, but was entirely voluntary on the part of the company. To show their appreciation of the consideration of their employers the workmen organized a demonstration on the night following the announcement and preceded by the Starrett Band they marched to Mr. Starrett's residence, where they serenaded him and presented him with a letter signed by all the foremen of the shop, in which very hearty acknowledgment was made of the generous action on the part of the company. The employees then proceeded to the residence of Frank E. Wing, prominently identified with the business of the company, who made an address on the subject of the relations between employers and employees, which was received with much enthusiasm.

Betterman & Cade, Carroll, Iowa, have sold out to Cade, Lenz & Rich.

J. A. HENCKELS' PARIS EXPOSITION CUTLERY EXHIBIT.

SOME conception of the scope and quality of the international Cutlery exhibit of J. A. Henckels, Solingen, Germany, at the Paris Exposition of 1900, where they were awarded the Grand Prize, is afforded by the statement in the London *Ironmonger* to the men of Sheffield that it was "an eye opener." The significance of this complimentary allusion is chiefly in the fact that it comes from a journal representative of Sheffield trade interests. This exhibit excited general admiration by its grandeur, beauty and artistic arrangement.

The entire exhibit was displayed in large showcases made of coral wood, built in Gothic style. There could be seen in these showcases almost all varieties and products of Cutlery imaginable, as this firm, founded in 1731, manufacture under the Twins brand, not only Pocket Knives, Scissors, Razors, &c., but everything else in the Cutlery line, as well as its own Steel.

In one of these showcases are displayed Pocket Knives and kindred goods. The Gothic pillars in this case were built up of Pocket Knives and Fencing Swords, and from the top of the case there was suspended a garland in thistle form made up entirely of Pocket Knives. A beautiful large show Knife with ivory handle, about 4 feet long, open, the rivets of which were made of 20 mark and 20 franc pieces, and the back of the blades handsomely engraved in gold, was fastened to the right of one of the pillars. On the handle is carved the figure of Hagen, of Wagner Nibelungen fame, who is holding up a small combination Knife with solid gold handle, symbolizing the "Rhine Gold," which he is in the act of throwing into the river Rhine.

A second showcase contains only Scissors and Shears from the smallest tiny Scissors 1 inch long up to the largest Tailors' Shears, as well as Pruning Shears and Surgical Scissors, Paper Shears, &c. The centerpiece of this case is a large show Scissors, over 6 feet long, of exceedingly fine workmanship, a real masterpiece. The handles of gold bronze are a work of art in themselves, and correspond in style with the school of architecture of the entire exhibit.

The third case contains Razors, Daggers and Hunting Knives.

Another case contains Carvers, Table Knives and Poultry Shears.

The fifth case displays Cooks' Knives, Bread Knives, Kitchen Knives and Forks, Butchers' Knives and Steels, Corkscrews and kindred goods.

The cases described above will be shown, together with a sixth view of the entire exhibit except two side cases, in a series of full page engravings in the advertising columns of *The Iron Age*, beginning with this issue and appearing weekly in consecutive order under the auspices of Graef & Schmidt, 107 Chambers street, New York, sole agents in the United States and Canada for J. A. Henckels. The branch houses of this concern are located in Berlin, Vienna, Hamburg, Cologne, Frankfurt-on-Main, Dresden and Copenhagen, and they have recently established a branch in Paris on the boulevard Poissoniere.

WIRE NAIL MILL OF HARTMAN MFG. COMPANY.

THE Wire Nail mill of the Hartman Mfg. Company of Ellwood City, at Ellwood City, Pa., is now in operation, and by August 1 the concern expect to be turning out 4200 kegs of Wire Nails per day, in addition to their other Wire Specialties. This concern, we are advised, have increased their surplus account to \$250,000, so that the surplus and capital now amounts to \$500,000. Their works are running night and day, and they have contracts on hand sufficient to run full from January 1 next. They have an exhibit at the Pan-American Exposition, located in the Agricultural Building, where a full line of their goods may be seen.

Notes on Foreign Trade

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE,
NORFOLK STREET, LONDON, W. C. }

Proposed American Importers' Association.

THERE is one striking aspect of the American trade in London which calls for comment, and it is this: Those interested in the importation of American metals, metal goods and machinery are strikingly ignorant of each other's existence. Here and there one meets an American who is known to his fellow countrymen pretty generally, but it remains a fact that there are probably a couple of hundred Americans in London at the present moment, all with common interests, who are split up into a large number of sections, each section not knowing the other. If they were British born and bred it would be understandable, because the British trader only takes to association in trade matters as a last resort. But, considering that most of them are Americans, and have been trained in the American habits of frankness and community of interests, it is a little striking that, as yet, there is no association of American importers and agents in Great Britain. During the past few weeks I have discussed this matter with several American business men, some of whom are enthusiastically in favor of some responsible person calling together those interested in American trade to form an association. The prevailing idea is that if those concerned were called together in the purely social way it would probably lead to the formation of an association which would cultivate not merely the social relations, but also take unified steps in the direction of trade policy and the rectifying of various trade difficulties. Let me briefly indicate one or two points upon which united effort might advantageously be exerted.

Agency and Credit.

To prevent the abuse of agency and to establish the credit of those engaged in the trade. It cannot, I think, be gainsaid that American exporters, by bitter experience, have justifiably become very suspicious of entering into business relations with importers or agents on this side of the Atlantic, unless they know something of them. As a result of this many *bona fide* importers and agents of real financial stability are irritated and even hampered in their work by the general policy of suspicion which holds good on the other side of the Atlantic. During the past two years I have repeatedly warned American exporters of sham business firms, without reputation and without capital, who seek to exploit American houses. It is affirmed that with an association devoted to the interests of American importers on this side it would be comparatively easy to spot these semifraudulent concerns with grandiloquent titles. If this were done it follows naturally that greater confidence would be engendered between exporter and importer, or between exporter and agent. If, therefore, an association on a really representative basis could be started over here it would be well worth doing for this reason alone.

Freightage Charges.

There is, however, a second advantage to be gained in the formation of an association. The whole question of freightage is in a state of chaos. One of the largest importers of American machinery met a competitor only a short time ago and asked him certain questions. Briefly they were: 1. What freight do you pay on such and such machines? 2. Who are the freight agents? 3. Into what docks do your goods go? These questions being answered, the next question was rather a staggerer. 4. Would you like to know how to save 50 per cent. on your freight rates? The firm of whom these questions were asked now admit that they have saved enormously by the good natured information given them as the outcome of a fortuitous conversation. There is no reason why full information should not be given to all American importers as to the question of freights, for

clearly the more American goods come into this market, and the more the British buyer is satisfied with the way

Americans do their trade, the more popular does the American trade become. The question of freightage has got to be dealt with. An experienced American trader over here told me the other day that he believed they had got their freights down to rock bottom. From what I have heard I beg to differ. Another importer told me only the other day that he has to keep a constant and watchful check upon his freight agents, and that the prices charged are arbitrary to the last degree. Here is another reason, then, that leads me to the conclusion that British importers would do wisely to come together into a more or less definite association.

To Meet Suitable Men.

There is, however, an even better reason than the foregoing for the formation of an association. Every week now witnesses some American business man coming over here with a view of opening up his line of goods. He wants to know where to go, and no matter how fully informed a man may be he cannot always accurately advise the business man where to find the best customers or the best agents. With an association in being, the secretary could be kept informed by members of the association as to what lines they want to handle, and as the information comes to him he can put the American business man into touch with exactly the right persons interested in his special line of goods. This important point was brought home to me in a vivid way only a fortnight ago. An enterprising American asked me to introduce him to a man who would be able advantageously to handle his goods. I gave him three names, all of whom are personally known to me. He went round and saw the gentlemen in question, and finally selected one. Coming back to this office, he remarked in a genially suspicious way that perhaps the man in question was a personal friend of my own. I had to give him my assurance that I only knew the gentleman in question in a business way, and that there were no private relations between us. Frankly, I did not like being compelled to make such an explanation. But I can see that as time goes on the same sort of suspicion may arise in the minds of other American visitors. If, however, the secretary of an association had it in black and white that so and so was on the lookout for such and such a class of goods, it would put the whole matter on a business footing, without cavil or suspicion.

Undercutting.

Other questions also are pushing themselves to the front, as, for example, useless undercutting. A provincial firm some time ago wrote to a firm of American importers in London here, asking the price of certain goods. The price was quoted. A month afterward the London firm received from America copies of letters sent by the provincial firm asking for quotations against their own agent. It is very pleasant to see the trust the Americans repose in their London representative, but where business relations are not so close as those existing between this London firm and their American principals, it might very well happen that the London importer would lose the business, and, in point of fact, be ignorant of the transaction. And this might well occur without the slightest breach of faith on the part of the American principals. Obviously, however, this is an unsatisfactory way of doing business. With an influential association in London, the enterprising provincial who wants to undercut the trade will find himself effectually checkmated. In addition to the reasons already indicated I suggest that an association once started could do a great deal in a quiet way to popularize American goods, while the members of the association would, in their turn, be put in the way of a great deal of information which at the present time they miss.

The Right Man for the Chair.

If this suggestion commends itself to the trade and there is developed a general desire for such an association of American Hardware and Machinery Importers, why would not Charles Churchill, the pioneer of Ameri-

can trade in London, be an appropriate choice for such an important place, provided he can be induced to assume the duties of such a position?

I have letters from a number of prominent Americans, some of whom have given in their adhesion to the idea without reservation, while others are willing to co-operate if good reason can be shown. Others, while expressing no keenness on the point, say quite frankly that if such an association is started they want to be in it. While my own experience in this matter is confined to the American trade in London, it is quite clear that American agents in Liverpool, Manchester, Glasgow, Bristol and elsewhere should also take an active part, particularly a number of our friends in Manchester and Liverpool.

Smoothing Personal Difficulties.

There is no use disguising the fact that there may be personal difficulties in the way. For example, So and So may say of This and That one that they are notorious undercutters, and want no dealings with them; to which I reply that undercutting has grown up as the outcome of misunderstanding, and that no firm in the world will sell at cost price or even under if by organization a reasonable profit can be secured. I may add that the London office of *The Iron Age* is entirely at the disposal of any American importers who would like to come together and discuss the advisability of proceeding along the lines roughly indicated. A small working committee of half a dozen American importers and agents, each representing a different section of the trade and meeting with a fair degree of regularity, could, I am convinced, put things into shipshape in six months' time.

REPORTS FROM EXPORT MARKETS.

We give below advices in regard to the conditions existing in some foreign markets, for which we are indebted to the courtesy of houses actively engaged in business and interested in American Iron and Hardware products:

Germany.

FROM CARL BLOMBACH, RONSDOFF, NEAR REMSCHEID.

My observations in regard to American Hardware in German markets are:

That American Hardware is very largely gaining ground here, and that even the smallest dealer in the most insignificant towns is reached by it. Therefore, the outlook for American manufactures is not bad, although trade in general at present is very quiet here in Germany and the surrounding countries.

But there is one thing which Americans should consider and which will become imperative by and by. I refer to the feeling not only of German manufacturers but of all Germans that German products ought also to find their way as easily and freely into the United States as American products do here. This, it is certain, would promote mutual business life to a great development and both countries would profit and trade increase enormously by it. In fact it would be a large step forward to the benefit of both peoples.

Austria.

FROM A PROMINENT HOUSE IN VIENNA.

In our judgment there cannot be anything said regarding the import of American goods into Austria until the new commercial treaties are ratified and the rates of revenue fixed. If these rates be set as high as originally projected it would mean as much as a prohibitory tariff, and the import of foreign articles would be restricted to those goods only which people cannot very well get along without.

Trade in the Levant

American trade in the Levant—that is, the countries bordering the Eastern Mediterranean—shows marked indications of growth. Both inquiries and orders are coming to New York houses from their Eastern branches which formerly were addressed to European competitors. Good orders are mentioned for Lamps, Nails, Saws, Ring Augers, Auger Bits, &c., and some business is being done in Locks for trunks and traveling bags. These lines mentioned in detail merely to indicate the character

of requests now emanating from Turkey and adjacent countries whose source of supply has been largely Europe. In the way of Saws, these countries are buying both American patterns and seeking also to have made in the United States their own peculiar styles, in which the teeth are reversed, thus causing the saw to cut when drawn toward the user instead of when pushed from him. There are peculiarities also in the handles. Heretofore it has been difficult to get American manufacturers to make these goods, but now two makers are willing to do so.

Southern Asia

East Indian trade is keeping up satisfactorily. Quantities of Iron Nails, Sheet Steel, Sheet Iron, Galvanized Iron Pails, Yellow Pine and certain kinds of cheap jewelry are being forwarded. To the Straits Settlements a leading item of export is Wrought Iron Water and Gas Pipe, Boilers, Tubes, &c. To China consignments of cotton duck for sails, tents, &c., and sheeting for domestic and other purposes are being sent. The Japanese are putting in water works largely, and are using Water Meters, Compression Bibs, Lead Pipe, Sluice Valves and the various other supplies of this character used for such purposes in residences and other buildings. America, however, is not getting the orders for Lead Pipe, the price of which in England is said to average approximately 25 or 30 per cent. less.

Central America.

There is a somewhat increased trade with Costa Rica, Nicaragua, Colombia and other West Coast Pacific ports, although the revolution in Colombia in a measure has restricted business with that country. One effect of the disturbance has been on the natives who, in time of peace, would be making collections of such products as Rubber, Ivory Nuts, &c., and taking the merchandise in canoes and boats to shipping ports, but are afraid to do so on account of the possibility of being conscripted. Many of them now run away and hide to avoid serving in the army.

MISCELLANEOUS ENGLISH HARDWARE NOTES.

BY VULCAN.

The praiseworthy attempt to organize the British Hardware traders is hardly meeting with the success it deserves.

Owing to the apathy and selfishness of the trade in the past, the dry goods people are fast acquiring the Hardware business as well. Manufacturers sell to drapers just as readily and as cheaply as to ironmongers, who cut the prices to a degree that the ironmongers cannot touch and live. Then there are the co-operative stores, and the factors who sell very nearly as cheaply to the general public as to the ironmonger. At a trade dinner the other night one gentleman said that two or three decades ago the Hardware business was held in high estimation and a heavy apprentice premium had to be paid. Assistants then were proud of their business, studied its intricacies, and fathomed technical difficulties; but nowadays the masters only thought about paying low wages and the men about doing as little work as possible.

As an instance of how English manufacturers treat English Hardwaremen, it is a fact that in Germany the leading makes of Screws can be bought at 20 per cent. less than in the home market.

It seems as if the American "stamp trading" companies were about to re-invade this country, as we hear of districts where the "system" is cropping up again. America was too clear sighted to accept "stamp trading," but several attempts at least partially successful have been made to establish it in this country.

The difficulty of finding sufficient shop space in some of the fashionable thoroughfares of London has led to the adoption of the principle of upstairs shops, very much after the style which prevails in our famous old City of Chester. We imagine it will be a little while ere ladies will take kindly to the new departure.

THE INDEPENDENT SHOVEL MAKERS.

A CALL has been issued for a meeting of the independent Shovel makers of the country, to be held in the Hollenden Hotel, Cleveland, Ohio, on Friday morning, June 21, at 10 o'clock. The object of the meeting is to talk over the matter of prices to be charged by the independent Shovel makers for their goods, and also for outlining some policy of defense, in case the members of the Shovel Association should adopt retaliatory measures against the independent Shovel makers. It is understood that all the outside Shovel firms have agreed to be present, and the meeting, no doubt, will be an important and interesting one. The capacity for making Shovels by the independent works is rapidly increasing, there being at least ten of these concerns now outside of the Shovel Association. These are as follows: Toledo Tube Company, Toledo, Ohio; Union Furnace & Mfg. Company, Altoona, Pa.; Beale Bros., Alton, Ill.; Penn Shovel Company, Corry, Pa.; A. B. Moore, Atlanta, Ga.; Collier Shovel & Stamping Company, Washington, Ind.; Pittsburgh Shovel Company, Leechburg, Pa.; Lewisville Shovel Company, Lewisville, Pa.; Danville Bessemer Company, Danville, Pa., and Richmond Shovel Company, Richmond, Ind. The above Shovel concerns have their works running with the exception of the Pittsburgh Shovel Company and two or three others.

COLUMBIAN ENAMELING & STAMPING COMPANY.

THE COLUMBIAN ENAMELING & STAMPING COMPANY were incorporated on the 3d inst. under the laws of the State of Indiana, with a capital stock of \$450,000. It is their intention to manufacture the lines of Enameled Goods formerly made by the Bellaire Stamping Company, Harvey, Ill., whose plant was destroyed by fire on December 31 last. The Bellaire Stamping Company are now liquidating their affairs. The expert labor and special talent engaged formerly with the Bellaire Stamping Company are connected with the new concern, and by January next the company expect to be in position to begin the manufacture of their line of Enameled Ware and Enameled Signs. Their plant will be modern in every respect, the manufacturing departments being fire proof and the warehouse building of the latest mill construction, with sprinkling equipment. The machinery will be entirely new and of the very latest type.

REQUEST FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

The Hockaday Hardware Company, Wichita, Kan., will very materially enlarge their Sporting Goods department when they move into their new building, which will be about August 1. They have secured the services of A. J. Mussleman, a thorough Sporting Goods man, who will take charge of that department at once and begin purchasing fall stock. They ask that all manufacturers of goods in that line send them catalogues.

BRYAN NOVELTY MFG. COMPANY.

BRYAN NOVELTY MFG. COMPANY, Bryan, Ohio, have complimented the winners of the first three prizes in *The Iron Age* Show Window Display Competition by presenting to each of them one of their Yunk patent Multiform Display Tables, illustrated in our issue, May 23 last. This company are also manufacturing the Ideal Automatic Folding Counter Stool, Twentieth Century Display Racks, Sweeper Broom Display Stand, Peerless Linoleum Floor Oil Cloth Rack and other specialties.

J. F. Williams, Hardware merchant, Augusta, Ill., has disposed of his business to C. L. Brunton.

HARDWARE CLUB.

AT the regular monthly meeting of the Board of Governors of the Hardware Club, June 17, a single member was admitted, John Sargent of Sargent & Co., New York, thereby filling the active membership to its constitutional limit of 600. This name was taken from the top of a waiting list of six, the balance of whom must wait their turn for vacancies to occur.

PRICE-LISTS, CIRCULARS, &c.

SALEM NAIL COMPANY, 279 Pearl street, New York: Circular in which attention is called to the advantages possessed by Galvanized Nails.

HENRY WEYAND, Waterbury, Conn.: Catalogue B, relating to Architectural Sheet Metal Work, of which he is manufacturer. It illustrates Skylights, Crestings, Finials, Ridge Roll, Cornices, Window Caps, Ventilators, &c.

INDIANA FOUNDRY COMPANY, successors to Sutton Bros. & Bell, Indiana, Pa.: Catalogue of Foundry Hardware, Mill and Farm Machinery, Stoves and Plumbers' Castings.

STANDARD CASTER & WHEEL COMPANY, 318-326 East Twenty-third street, New York: Circulars calling attention to the special features and advantages possessed by their Standard Ball Bearing Steel Caster. The company will be pleased to send a sample on request, and if a mailing card accompanying the circular is filled out by the merchant will be pleased to send him free of charge a whole set for his office chair. For merchants who do anything in the way of furniture repair work, they issue some unique cards, which they are confident will bring some trade for recasting furniture, which is said to be a good line of business to develop.

TRADE ITEMS.

THE WILCOX MFG. COMPANY, manufacturers of Door Hangers and other Hardware Specialties, Aurora, Ill., find such an increasing demand for their goods in Eastern markets that they have opened a warehouse at 925 Market street, Philadelphia, and employed a resident salesman. This representative is John A. Brainerd, who is widely and favorably known in the local Hardware trade, having been connected for some time as clerk in the employment of P. & F. Corbin in their Philadelphia office. The Wilcox Mfg. Company are making great progress in introducing their trade over a very wide territory.

D. LE ROY DRESSER, who was recently elected president of the Merchants' Association of New York, is a director in the following corporations: American Brass Company, Holmes, Booth & Haydens, Benedict & Burnham Mfg. Company, American Pin Company and Waterbury Watch Company.

AMONG THE HARDWARE TRADE.

Blaisdell & Johnston, Rockland, Maine, have been succeeded by the Rockland Hardware Company, who have been incorporated with a capital of \$10,000.

W. J. Tabor, Holland, N. Y., has enlarged his store, so that now it has a frontage of 42 feet with a depth of 96 feet. The establishment has been thoroughly renovated and the facilities for carrying on business are very much improved. Mr. Tabor expects to add a complete stock of groceries in the near future.

Echols Mercantile Company have commenced business in Echols, Minn., handling a line of general merchandise, including Hardware, Farm Implements, &c.

C. J. Stark is successor to Stark & Erickson in the Hardware, Stove, Furnace and steam and hot water heating business in Ortonville, Minn.

W. H. Nellings has admitted a partner in his Hardware and Stove business in Monona, Iowa, and the style has become Nellings & Killen.

Wm. Whalen, Douglas, Neb., has sold his Hardware, Stove and Tinware business to Schoenthal Bros., who will continue at the old stand.

Treece & Brinser have bought the McKee Hardware business in North Lewisburg, Ohio. They will also handle lumber.

McCulloch & Thomas have succeeded Thomas & McKinley, Humeston, Iowa, in the retail Hardware, Stove, Agricultural Implement, and Buggy and Wagon business.

The Shifley & Burdich Company, Toledo, Ohio, have been incorporated with a capital stock of \$10,000. I. J. Shifley, L. F. Burdich, C. A. Peckham, Marguerite F. Shifley and J. R. Burdich are the interested parties. They will continue the business formerly carried on under the style of Shifley & Burdich, 2011 Adams street. In addition to the sale of Shelf Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c., they do an extensive Cornice business.

Geo. W. Heun, Howells, Neb., has sold his Hardware, Farm Implement and furniture business to the Howells Hardware Company. Mr. Heun will hereafter devote himself to the lumber business.

Howlett Bros., Gregory, Mich., bought the Russell Hardware stock at Stockbridge, and after a three weeks' special sale removed the balance of it to Gregory.

Jones & Tudor, Van Wert, Ohio, have lately taken possession of a new building, a handsome and finely appointed two-story structure, substantially built of fine pressed brick and stone. The building is 40 feet wide and 132 feet deep, and contains nearly 15,000 square feet of floor surface. There are two large plate glass show windows, 14 feet in width and 15 feet high. The attractive storeroom is fully equipped with the Warren Hardware shelving, access to which is secured by means of the Myers extension ladders. The firm are the oldest Hardware concern in Van Wert, and not only do a large retail trade in their own and adjoining counties, but also do a considerable wholesale business in Ohio and parts of Indiana and Michigan.

Sharber & White, Elizabeth City, N. C., have removed to larger and more commodious quarters. They occupy a large building, three stories, in which there is a complete sample room for jobbing trade. The firm do a wholesale and retail business in general Hardware.

S. A. Wilkes, Clarksburg, Mo., has admitted a partner in his Hardware, Stove, Agricultural Implement and furniture business, and the style is now Wilkes & Hodge.

L. A. Spaulding has bought an interest in the Hardware and plumbing business of F. W. Carr, Newport, Vt., and the firm name is now Carr & Spaulding.

Roberts & Gardner, dealers in Hardware, Stoves, Tinware, &c., Wellsboro, Pa., have added a line of Agricultural Implements. The firm are occupying a new store, 40 x 90 feet, three stories high.

E. S. Williams & Son have bought the stores in Westminster, Texas, formerly conducted by Hullinger & Ashton and I. P. Rosser.

Isaac A. Brown has disposed of his Hardware, Stove and Tinware business in Monon, Ind., to Phelps & Treanor.

T. Kirkham has sold an interest in his Hardware business at Lethbridge, Ontario, Canada, and the style is now Kirkham & Stewart.

The Hardware store of B. N. Wasson, Ewart, Iowa,

was burned out on the 2d inst. Mr. Wasson has a new building in course of erection and will soon be ready for business again. His line covers Shelf and Heavy Hardware, &c.

Tall & McCulloch are successors to Tall, Merrill & Co., Pomeroy, Iowa.

I. N. Wheeler has purchased the interest of the late W. E. Von Kuster in the Hardware firm of McNulty, Von Kuster & Helgeson, Litchfield, Minn., and the name has been changed to McNulty, Wheeler & Helgeson.

The S. B. Hubbard Company, Jacksonville, Fla., whose establishment, together with a \$200,000 stock, was destroyed in the great fire a few weeks since, have re-established themselves in temporary quarters on the corner of Bay and Market streets. The building is one story high and 200 feet square, and they have a pretty complete stock of goods. Here they expect to remain for about a year, or until such time as they can rebuild. Their new building, they advise us, will be one of the most complete and up to date establishments in the country.

Sistersville Hardware Company, Sistersville, W. Va., have changed the style of their concern to Berry Hardware Company, and increased the capital stock from \$10,000 to \$20,000. They have just opened a new branch store at Clarksburg, the building occupied being 36 x 100 feet, three stories, with wareroom in rear, 25 x 100 feet. The retail Hardware salesroom is referred to as especially attractive and well arranged. The company are wholesalers and retailers of Shelf and Heavy Hardware, Stoves, Tinware, Farming Implements, Sporting Goods, Builders' and Contractors' Supplies, &c.

The old firm of Teague, Barnett & Co., for 25 years in business in Montgomery, Ala., have sold out. A new firm, under the style of G. W. Barnett & Son, have been organized by G. W. Barnett, connected with the old concern for 25 years, and W. R. Barnett, whose identification with them dates back ten years. The members of the firm have thus a thorough knowledge of the wholesale Hardware business, and invite the orders of their friends with confidence that they can serve them acceptably. They especially solicit mail orders, which will receive their personal attention.

The new building occupied by the retail department of the Simmons Hardware Company, St. Louis, Mo., is five stories high and nearly half a block long. On the main floor are exceptionally complete stocks of Sporting Goods, Cutlery, Builders' Hardware and Photographic Supplies. The second floor is given up entirely to goods in the house furnishing line, of which there is an enormous variety. On the third floor are great stocks of Queensware, Glassware, &c. The building is located at Broadway and St. Charles street, and has been admirably fitted up with especial regard for the requirements of the business to which it is devoted.

Carl Stroebel, Hardware merchant, Central Lake, Mich., has sold out to Walter V. T. Swasey & Co., Limited, who continue at the old stand.

Edwin M. Livingston has succeeded E. W. Livingston in the Hardware, Stove and Tinware business, in Capron, Ill.

Manning & Hall, Hardware merchants, Gypsum, Kan., have dissolved. C. B. Manning is successor at the old stand.

The Albuquerque Hardware Company, Albuquerque, N. M., some time since purchased the stock and business of the Donahoe Hardware Company and moved it, May 1, to their new quarters, 120 West Gold avenue, where they are now comfortably settled. The company are

wholesalers and retailers of Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting and Athletic Goods, &c.

A. B. Ware, Opelika, Ala., on June 1 admitted as a partner in his business Thomas R. Frazer, and the style of firm is now A. B. Ware & Co. The firm have rented a warehouse, 30 x 300 feet, on railroad, and will conduct a wholesale business in Hardware and Wooden Ware, employing three travelers.

MISCELLANEOUS NOTES.

J. Stevens Arms & Tool Company.

J. Stevens Arms & Tool Company, Chicopee Falls, Mass., have recently placed on the market a full line of high grade golf clubs at popular prices. They are also notifying the trade that they are prepared to furnish a full line of rifle cleaning rods—from the plain slotted coppered to the fancy jointed with cocobolo swivel handles—and are making attractive prices for quantity orders.

Ad-el-ite Floor Finishes.

The Adams & Elting Company, 155 to 157 Washington Boulevard, Chicago, are offering to the trade a special line of floor finishes under the name of Ad-el-ite floor finishes. These comprise a special Golden Oak filler for parquet floors, Plymouth Rock floor wax, the Crystal White wood filler and the Lightning floor restorer. They also manufacture floor stains in various colors for use before the filler or finishing material is applied. The



Fig. 1.—The Joy Wagon Wrench.

company have issued illustrated catalogues referring to these goods, and giving directions how to keep floors in order, which will be sent to any address on application.

R. W. Whitehurst Company.

The R. W. Whitehurst Company, Norfolk, Va., were incorporated under the laws of the State of Virginia at the beginning of the year. They are just now putting a complete line of hose reels on the market and are also getting up a full line of wine or fruit presses and a full line of hose rollers, for use on lawns, golf grounds, roads and for farm purposes. Patents on the latter have been secured by Mr. Whitehurst. The company will shortly issue an illustrated catalogue of their various lines.

Union Mfg. Company's New Line of Wood and Iron Planes.

The reference in our last issue to the line of planes put on the market by the Union Mfg. Company, New Britain, Conn., and 103 Chambers street, New York, was somewhat misleading, inasmuch as the planes are now actually on the market and are being already received with favor by the trade. It is the intention of the company to make a complete line of iron and wood planes equal in quality to the best on the market. Their familiarity with the manufacture of high grade iron working tools, including lathe and drill chucks, &c., gives them the requisite experience for success in this new departure.

Agricultural Wrench, Solid Steel Bar.

Penn Radiator Company, Corry, Pa., for whom Allerton-Clarke Company, 97 Chambers street, New York, are selling agents, have just put on the market an agricultural screw wrench. The head and bar are drop forged from a solid piece of steel, and the jaws

are case hardened. A feature to which reference is made is the specially cut thread and working quality of the wrench, which is made in all sizes, 6 to 15 inches long.

Self Sealing Tubes of Glue.

Russia Cement Company, Gloucester, Mass., and 103 Reade street, New York, have just put on the market their Le Page's glue in self sealing collapsible tubes in two sizes, that retail for 10 and 15 cents each. The tube, like all such receptacles for paste, colors, &c., is of soft metal in one piece and pinched together at the bottom after the glue is in, the other end being conical in shape, with the center in the form of an inverted cone, so that to get at the contents it is only necessary to make a small puncture with a pin and press out the desired quantity. The shape of the head enables the individual to use it something like a brush, the small amount of glue remaining in the depression sealing the puncture and keeping the contents in its original condition, piercing the head whenever a supply of the adhesive is desired. This method obviates waste and makes the glue immediately available.

The Joy Wagon Wrench.

The Joy patent adjustable and locking wagon wrench, herewith illustrated, is manufactured by E. R. Klemm, 103-107 West Monroe street, Chicago, Ill. The wrench is made in two styles of handles, as shown in the cuts, while Fig. 1 also illustrates the wrench with the jaws open, and Fig. 2 shows the wrench holding

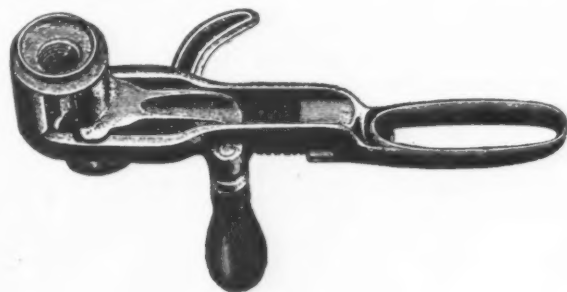


Fig. 2.—The Joy Wrench Holding Nut.

the nuts can be drawn up very firmly to prevent their backing off. The manufacturer claims that the tool is possessed of desirable features not found in other wagon wrenches.

Swedoh Tubular Racing Skate.

The Union Hardware Company, Torrington, Conn., New York office in charge of Tower & Lyon, 95 Chambers street, have just brought out the Swedoh tubular racing skate, here illustrated. Although designed primarily as a racing skate, it can be used generally by skaters. It is handsome in appearance, as well as light and strong. The runners are made of high grade tool steel 1-16 inch

thick and are very hard. Brazed to the runner is a diamond shaped tube extending almost the entire length of the blade, which supports the runner, so that it can neither spring nor warp. The foot plates are fastened to the runner by means of steel shells, which are brazed to the diamond runner tube, thus making a very rigid skate, weighing but 22 ounces per pair. The skates are secured

The cut shows the exact size of a 25-foot spool of No. 18 insulated wire.

New Shakespeare Rubber Standard Reel.

William Shakespeare, Jr., Kalamazoo, Mich., has brought out the new reel shown herewith. In Fig. 2



Fig. 1.—Swedish Tubular Racing Skate.

to the soles of the skaters' shoes by means of screws. Three lengths of runners are made and the following sizes can be supplied—viz.: 14-inch runner, 10½ and 11

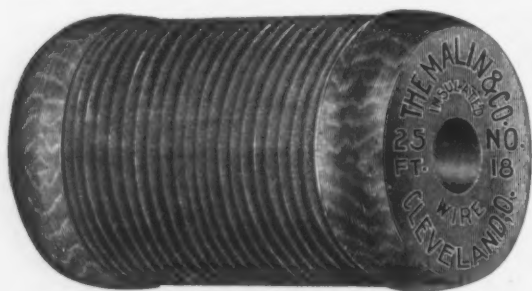


Fig. 2.—Cross Section Showing How Runner is Supported.

inches; 16-inch runner, 10½, 11 and 11½ inches; 18-inch runner, 11, 11½ and 12 inches.

Spooled Insulated Wire.

Malin & Co., Cleveland, Ohio, have put on the market, in addition to the various lines of spooled bare wires of different metals and finishes, insulated wire on spools in 25, 50 and 100 foot lengths, for the retail trade.



Spooled Insulated Wire.

Put up in this form the buyer gets a neat, attractive and salable article, while both the seller's and customer's time is saved. The smaller consumer of insulated wire

the manner of taking the reel apart is illustrated. The maker advises us that he has devoted three years to the manufacture of special tools and machinery for turning out a fine reel designed to meet the requirements of anglers, in which the parts should have a variation not to exceed 1-1000 inch. With the exception of the journals and bearings, which are burnished and fitted by hand, all parts of the reel are made by accurately working mathematical tool machines. When the parts are finished they are assembled and adjusted by a skilled watchmaker, so that the reel when completed is offered as a fine piece of work. The journals and pinion are

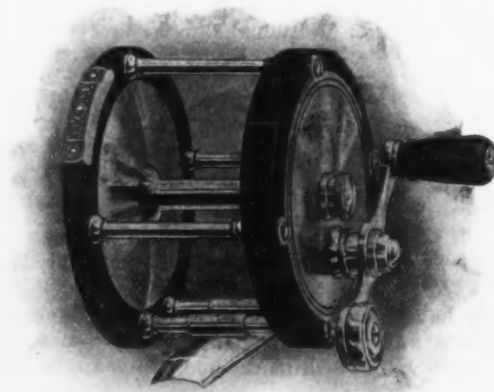


Fig. 1.—New Shakespeare Rubber Standard Reel.

described as made of finest tool steel; the gear, bushings and pillars of hard drawn brass; the heads of hard rubber, and the end plates are finished in triple oxidized silver plate with nickel trimmings. The reel is an 80-yard quadruple multiplier, and is designed to be readily taken apart and easily assembled. It is stated that the



Fig. 2.—Manner of Taking the Reel Apart.

usually requires it by the foot, knowing little about the corresponding weight. In spooled form the necessity for measuring lengths off by the foot is obviated, thus giving the purchaser the article in fine condition, as well as saving much time and insuring a better profit.

bearings are so perfect that a slight start given the crank will produce a free, noiseless movement, so devoid of friction that the angler is at once impressed with the nicety of the mechanism. The reels are sold at \$6 each.

Cleveland Prism Glass.

Cleveland Window Glass Company, Cleveland, Ohio, are manufacturing the Cleveland prism glass for lighting up interiors with natural light, by means of prisms so arranged that beams of sunlight are bent and carried into otherwise comparatively dark rooms, on a plane with the floor and ceiling, more particularly street floors, cellars and kindred places, although they are also used much higher up. The glass prisms are made in 4-inch

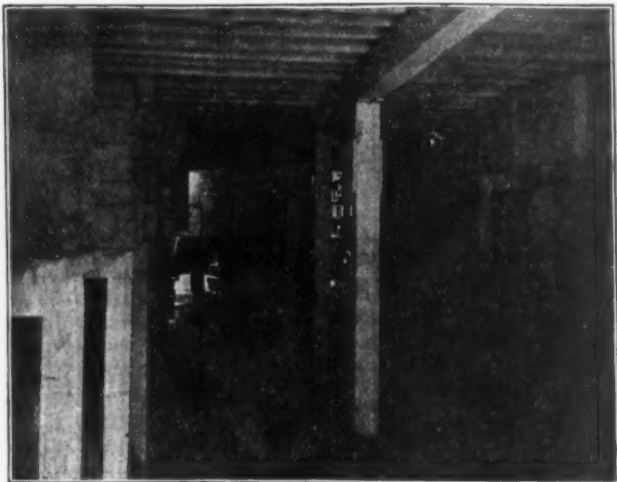


Fig. 1.—A Cellar without Prism Glass.

squares, which are set in either zinc or copper frame work, according to the cost, the size of which depends on the dimensions of the sash to be covered. They can be furnished for sash or in a separate frame to go outside the sash. Applied to old work the frames are secured to the outside of the window, usually covering the upper half of it, the lower portion remaining plain glass to see through. The frame work of prisms is sometimes vertical and often at an angle with the eleva-

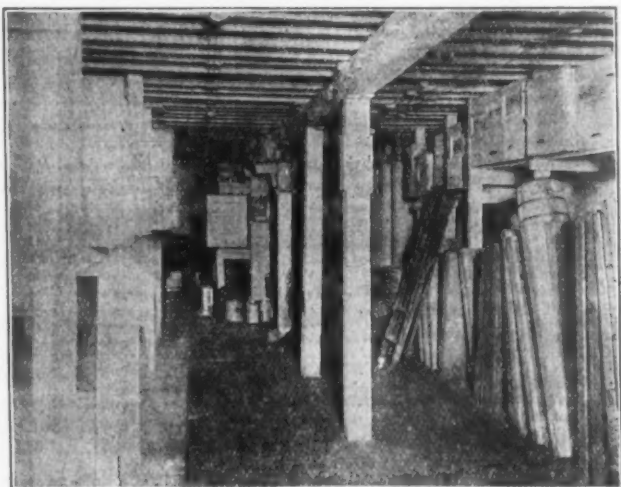


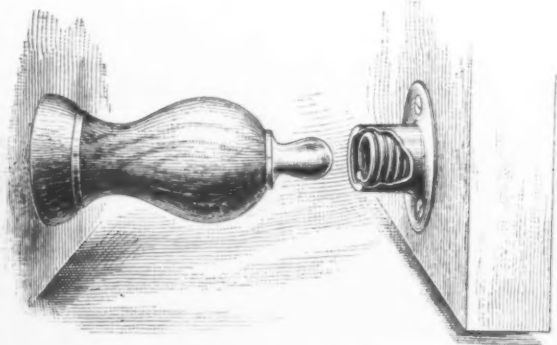
Fig. 2.—Same Cellar with Five Feet of Prism Glass.

tion of the building, according to the requirements of the situation. Fig. 1 illustrates a cellar interior 85 feet long, as it was, with only one window at the end, Fig. 2 being designed to show the great increase of natural light produced by the installation of the prisms.

The Perfect Door Stop and Fastener.

The cut here shown is of a door stop and fastener put on the market by the Franklinville Novelty Works, Franklinville, N. Y. The socket that fastens on the door contains a coil spring, into which the metallic bolt head, on the end of the wooden stop, is forced when the door is pushed against it. The inside diameter of the coil spring is slightly smaller than the diameter of the bolt head, the former expanding sufficiently to receive the

bolt head, where it is retained until the bolt head is released by closing the door. Among other advantages of the device the following are enumerated: That there is no rubber used in its construction; that it not only acts as a stop, but also holds the door open; that it obviates the necessity of placing a weight or chair against the door; that a slight push sets it and a slight pull releases

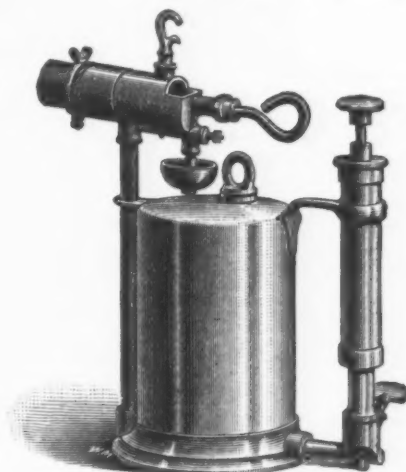


The Perfect Door Stop and Fastener.

it; that it can be put on the base board, wainscoting or molding; that it can be used on any door in a house, and that it is especially suitable for doors that swing both ways, including those in churches, hotels and stables.

The Quick Meal Paint Burner.

The Ringen Stove Company, 410 to 414 North Sixth street, St. Louis, Mo., have just brought out the Quick Meal paint burner or painters' lamp, of which an illustration is shown herewith. The main features to which special attention has been given are simplicity and durability, combined with a low price. The body of the tank is constructed of heavy brass drawn out of one sheet, which makes it very strong. The bottom is composed of cast brass securely fastened to the body. All parts are made of brass except the pipe leading to the burner. The air pump is contained in the handle and is of exceedingly simple construction. An air valve below the pump confines the air in the tank after being pumped up. The handle of the needle valve is formed in the shape of a loop. When hot it may be operated by inserting through the loop a screw driver or other tool. The burner throws a powerful flame from 6 to 8 inches long. The hook and notch on top of the burner are designed to hold a soldering iron. This enables the lamp to be used not only by painters, but also by plumbers, tinner or other workmen who need a torch to throw a powerful flame. It is stated to be an ideal burner

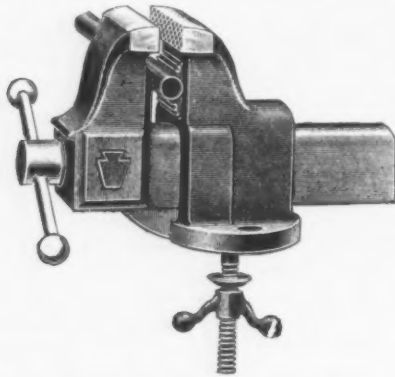


The Quick Meal Paint Burner.

for thawing frozen water pipes, and that while the device is exceedingly light, yet it is constructed so as to make it very durable. The lamp has been the subject of thorough experiment with the company, who claim that it is a decided improvement over the usual lamp or torch of this character.

Keystone Combination Roller Pipe Vise.

The Hollands Mfg. Company, Erie, Pa., are putting on the market the combination pipe vise shown herewith. For holding pipe, roller jaws are used instead of the old style V, the rollers having from 25 to 40 flutes, according to the size of the vise. The rollers rest on round corners in the body of the vise, and not on the pins, which simply keep the roller from dropping out. A slight pressure of the screw, it is explained, makes the purchase so great that it is impossible for the roller or pipe to turn. It is remarked that the roll-



Keystone Combination Roller Pipe Vise.

ers will not mar the pipe; that they will never wear out; that the roller jaws do not interfere when doing machine work, and that the vise is adapted not only to the use of machinists, but also to plumbers', gas fitters' and steam fitters' use. The vise is referred to as high grade throughout.

The Modern Ice Pick.

Gilchrist & Means, 43 South Canal street, Chicago, Ill., have just placed on the market the ice pick herewith shown. The handle is of solid metal, making it quite heavy. The pick is nickel plated, and one style is made



The Modern Ice Pick.

with the head of the set screw countersunk, so that it does not project beyond the surface. No hammer or mallet is required in using the pick, a succession of smart strokes cracking the ice as desired.

Olof Dahlheim, Evansville, Minn., has been succeeded by Evansville Lumber Company, who have expended about \$800 or \$900 in improvements in the store. The stock has also been increased.

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Current Hardware Prices.

REVISED JUNE 18, 1901.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33½@33½@10% signifies that the price of the goods in question ranges from 33½ per cent. discount to 33½ and 10 per cent. discount.

Cut Prices.—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, per doz. \$3.00...33½@33½@10%
North's...10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent...25¢
Taplin's Perfection...30%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils...\$ 7½@7½¢
Hay-Budden, Wrought...9¢@9½¢
Horseshoe brand, Wrought...9¢@9½¢
Samson...\$ 7½@7½¢
Trenton, Wrought...\$ 8½@8½¢

Imported—

Peter Wright's...0½@9½¢

Anvil, Vise and Drill—

Millers Falls Co., \$18.00...30%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Hull Bros. Co.,
Lots of 1 doz...25%
Smaller Lots...20%
Lots of 3 doz...30%

Augers and Bits—

Com. Double Spur...70¢@1
Boring Machine Augers...60¢@10¢@70¢@10¢

Car Bits, 12-in. twist—

Jennings' Pattern:
Auger Bits...50¢@10¢@50¢
Ford's Auger and Car Bits...40¢@10¢
Forester Pat. Auger Bits...25¢
C. E. Jennings & Co.,
No. 10 ext. lip, R. Jennings' list...40%
No. 80, R. Jennings' list...50%
Russell Jennings'...25¢@10¢@25¢
L'Hommedieu Car Bits 15¢@10¢@15¢
Mayhew's Countersink Bits...45¢
Pugh's Blacksmith's Pattern...35¢
Snell's Auger Bits...60%
Snell's Bell Hangers' Bits...50¢@10¢
Snell's Car Bits, 12-in. twist...60%
Wright's Jennings Bits (R. Jennings' list)...50%

Bit Stock Drills—

Standard List...65¢@65¢@5%

Expansive Bits—

Clark's small, \$18; large, \$20...50¢@10%
Larigue's Clark's Pattern, No. 1, \$1 doz., \$26; No. 2, \$18...50¢@10%
C. E. Jennings & Co., Steer's Pat...33½¢
Swan's...60%

Gimlet Bits—

Common Double Cut, gro. \$2.25@2.75
German Pattern...gro. \$3.25@4.50
Double Cut, makers' lists...50¢@50¢@10%

Hollow Augers—

Bonney Pattern, per doz. \$11.00@11.50
Ames...25¢@10%
New Patent...25¢@10%
Universal...20%
Wood's Universal...25%

Ship Augers and Bits—

Ford's...40%
Suell's...40%
C. E. Jennings & Co.,
L'Hommedieu's...15¢@10%
Watrous'...40%

Awl Hafts, See Hafts, Awl.

Awls—

Brad Awls:
Handled...gro. \$2.75@3.10
Unhandle, Shouldered, gro. \$5.25@5.50
Unhandle, Patent...gro. \$6.00@7.00

Peg Awls—

Unhandle, Patent...gro. \$1.25@1.50
Unhandle, Shouldered, gro. \$5.25@7.00

Scratch Awls—

Handled, Common, gro. \$3.50@4.00
Handled, Socket, gro. \$11.50@12.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First Quality, best brands, \$5.50@5.75
First Quality, other brands, \$5.25@5.50
Jobbers' Special Brands:
Good Quality...\$5.00@5.25
Best Quality...\$5.25@5.75
Cheap, Handled Axes...\$5.50@5.75
Beveled, add 25¢ doz.

Axle Grease—See Grease, Axle.

Axles—

Concord, Loose Collar...4½¢@5¢
Concord, Solid Collar...4½¢@5¢
No. 1 Common...3½¢@4¢
No. 1 Com. New Style...3½¢@4¢
No. 2 Solid Collar...4½¢@5¢
Nos. 11 to 14...70¢@10¢@75¢
Nos. 15 to 18...60¢@10¢@60¢@10¢
Nos. 19 to 22...75¢@75¢@10%

Boxes, Axle—

Common and Concord, not turned...lb. 5¢
Common and Concord, turned...lb. 6¢
Half Patent...lb. 8¢@9¢

Balances—Sash—

Caldwell new list...50%
Pullman's...60%

Spring—

Spring Balances...50¢@10¢@50¢@10¢@5%
Chatillon's:
Light Spg. Balances...40¢@10%
Straight Balances...40%
Circular Balances...50%
Large Dial...30%
Pouze...50%

Barb Wire—See Wire, Barb.

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb. 2¢@3.10¢

Beams, Scale—

Scale Beams, List Jan. 12, '95, 30¢@10%
Chatillon's No. 1...30%
Chatillon's No. 2...40%

Beaters—Egg—

Standard Co.,
No. 6 Steel Handle Dover, per gro. \$0.50
No. 10 Cast Handle Dover, per gro. \$3.00
No. 10 St-el Handle Dover, per gro. \$8.00
No. 15 Extra Heavy Steel Handle, per gro. \$15.00

Rival, per gro. \$1.00

Tag Mfg. Co., per gro. \$0.50
No. 50 Small Family size...\$0.50
No. 100 Regular Family size...\$3.00
No. 102 Regular Family size tinned...\$9.50
No. 150 Large Family size...\$15.00
No. 152 Large Family size, tinned...\$17.00

Lyon's Standard size, per doz. \$1.75

Wonder (S. S. & Co.), per gro. \$7.50

Bellows—

Blacksmith, Standard List, 70¢@70¢@10%
C. E. Jennings & Co., Blacksmith, 60¢@10%
C. E. Jennings & Co., Hand...33½¢

Blacksmiths—

Inch...30 32 34 36 38 40
Each, \$3.50 3.75 4.25 4.80 5.35 6.15
Extra Length:
Each, \$4.00 4.55 5.10 5.60 6.40 7.50

Molders—

Inch...9 10 11 12 14 16
Doz...\$6.75 7.25 8.50 9.50 12.00 14.50

Hand—

Inch...6 7 8 9 10 12
Doz...\$3.75 4.25 4.50 5.00 5.7 6.75

Bells—Cow—

Ordinary goods...75¢@5¢@75¢@10%
High grade...70¢@70¢@10%
Jersey...75¢@10%
Texas Star...50%

Door—

Abbe's Gong...55%
Bar-Con Gong...55%
Home, R. & E. Mfg. Co.'s...55¢@10%
Lever and Pull, Sargent's...20¢@10¢@10%
Yankee Gong...55%

Hand—

Hand Bells, Polished...60¢@5¢@60¢@10%
White Metal...55¢@55¢@10%
Nickel Plated...50¢@5¢@10%
Swiss...60¢@60¢@10%
Silver China...30¢@30¢@10%

Miscellaneous—

Form Bells...lb. 2¢@4¢
Steel Alloy Church and School...50¢@10¢@50%
Wilmet & Hobbs Mfg. Co., Gongs...70%

Belting—Rubber

Agricultural (Low Grade), 75¢@10¢@30%
Common Standard...75¢@75¢@10%
Standard...70¢@70¢@10%
Extra Grade...60¢@10¢@75%
Boston Belting Co., 50¢@10¢@70¢@10¢@5%
Seamless Stitched, Imperial...45¢@5%
Boston...50¢@5%
Niagara...60¢@5%

Leather—

Extra Heavy, Short Lap...50¢@10¢@80%

Regular Short Lap 60¢@10¢@60¢@10¢@5%

Standard...60¢@10¢@10¢@70¢@5%

Light Standard...70¢@70¢@10%

Cotton—

Rossendale-Reddaway B. & H. Co.,
Sphinx B-and...60¢@10%
Durable Brand...70%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters...20%
Stoddard's Lightning Tire Upsetters...40¢@50%

Bicycle Goods—

John S. Leng's Son's 1899 list:
Chain...50%
Parks...50%
Spokes...60%
Tub's...60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—
See Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—Tackle—

Common Wooden...70¢@70¢@10%
Cleveland Steel...60¢@10¢@70%
Ford's Star Brand Self Lubricating...80¢@10%

Hollow Steel, Ford's Pat. Star Brand...50¢@10%

Lane's Patent Automatic Lock and Junior...30%
Stowell's Novelty, Mal. Iron...50%
See also Machines, Hoisting.

Beards Stove—

Zinc, Crystal, &c...40¢@10¢@%

Boils—

Carriage, Machine &c.—
Common, list Jan. 3, '95...65¢@10¢@%
Norway Iron, \$3.00, list Oct. 7, '94...80¢@80¢@5%
Philo. Eagle, \$3.00 list May 24, '99...80¢@80¢@10%

Bolt Ends, list Jan. 3, '95, 70¢@75¢@%

Machine, list Oct. 1, '99...70¢@75¢@%
Machine with C. P. C. & T. Nuts...65¢@12½¢

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:
Inch...3 4 5 6 8
Per doz...\$0.26 .30 .39 .47 .55

Cast Iron Spring Foot—

Inch...6 8 10
Per doz...\$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned—

Inch...6 8 10
Per doz...\$0.75 1.05 1.30

Cast Iron Shutter, Brass Knobs—

Inch...3 4 5 6 8
Per doz...\$0.67 .80 1.00

Wrought Barrel Brass Knob—

Inch...3 4 5 6 8
Per doz...\$0.44 .50 .61 .70 1.83

Wrought Barrel...70¢@10¢@75¢@5%

Wrought Flush, B. K., 50¢@10¢@50¢@10%
Wrought Shutter...40¢@10¢@60¢@10%
Wrought Square Neck...50¢@50¢@10%
Wrought Sunk...50¢@50¢@10%
Ives' Patent Door...60%

Stove and Plow—

Plow...60¢@10¢@%
Stove...71¢@71¢@10%

Tire—

Common...75¢@75¢@10%
Norway Iron...80¢@80¢@5%
American Snow Company
Norway Phila. list Oct. 16, '94...82½¢
Eagle Phila. list Oct. 16, '94...85%
Bay State, list Dec. 28, '90...77½¢
Franklin Moore Co.,
Norway Phila. list Oct. 16, '94...83½¢
Eagle Phila. list Oct. 16, '94...85%
Eclipse, list Dec. 28, '90...77½¢
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '90...77½¢
Keystone Phila. list Oct. '94...85%
Norway Phila. list Oct. '94...82½¢

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch...1 1½ 1¾ 2
Per doz...\$4.50 5.00 5.75 7.95

Inch...2½ 3 3½ 4
Per Doz...\$8.65 11.50

Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each...25%

Boring Machines—See Machines, Boring.

Boxes Mitre—

C. E. Jennings & Co...40%
Seavey's, per doz., \$39...40%

Braces—

NOTE.—Most Braces are sold at net prices.
Common Ball, American...\$1.15@1.45
Barber's...60¢@10¢@60¢@10%
Fray's Genuine Spofford...75¢@10%
Fray's No. 70 to 120, 81 to 125, 207 to 414...60%
C. E. Jennings & Co...50¢@10%
Mayhew's Batchet...80%
Mayhew's Quick Action Hay Patent...50%
P. S. & W. Co. Peck's Patent...60¢@10¢@55¢@%

Brackets—

Wrought Steel...75¢@5¢@75¢@10%
Bradley's Wire Shelf:
Full cases...80%
Broken cases...75¢@10%
Griffin's Pressed Steel...75%
Griffin's Folding Brackets...70¢@10%

Bright Wire Goods—See Wire and Wire Goods.

Broilers—

Wire Goods Co...75%
See Pails

Buckets, Well and Fire—

See Pails

Bucks, Saw—

Boss...per gro. \$48.00
Booster...per gro. \$36.00

Bull Rings—See Rings, Bull.

Butts—Brass—

Wrought list Sept., '96...40¢@40¢@5%
Cast Brass, Tiebolt's...50%

Cast Iron—

Fast Joint, Broad...50¢@50¢@10%
Fast Joint, Narrow...50¢@50¢@10%
Loose Joint...70¢@5¢@70¢@10%
Loose Pin...70¢@5¢@70¢@10%
Mayer's Hinges...70¢@5¢@70¢@10%
Parliament Butts...70¢@5¢@70¢@10%

Wrought Steel—

Loose Joint...70¢@10¢@75%
Table and Back Flaps...70¢@10¢@75%
Narrow and Broad...70¢@10¢@75%
Inside Blind...70¢@10¢@75%
Loose Pin...70¢@10¢@75%
Loose Pin, Ball and...70¢@10¢@75%
Steeple Tip

Bronzed Wrt, Nar. and Inside Blind Butts...50¢@10¢@60%

Cages, Bird—

Handy, Brass:
3000, 5000, 1100 series...5%
1200 series...83½¢
200, 300, 600 and 900 series...40¢@10%

Handy, Bronze—

700, 800 series...40¢@10%
Handy, Enameled...40¢@10%

Calipers—See Compasses.

Calks, Toe and Heel—

Blunt, 1 prong...per lb. 4¢@4½¢
Sharp, 1 prong...per lb. 4½¢@4¾¢
Perkins' Blunt...\$ 5
Perkins' Sharp...\$ 5½

Can Openers—See Openers, Can

Cans, Milk—

Illinois Pattern, \$1 75 8 10 gal.
Iowa Pattern...2.40 2.80 each.
Buffalo Pattern...2.40 2.50 each.
30 90 40 qt.
New York Pattern 3.00 3.25 3.40 each.
Balt more Pattern 2.50 2.85 3.10 each.

Cans, Oil—

Buffalo Family Oil Cans: 10 gal. \$48.00 60.00 108 gro

Caps—Percussion—

Eley's E. B...60¢
G. D...per M 2¢@3½¢
F. L...per M 27¢@40¢
G. E...per M 47¢@50¢
Musket...per M 57¢@60¢

Primers—

Berdan Primers, \$1.00...5%
B. L. Caps (Sturtevant Shell) \$1.00...5%
All other primers...\$1.10@1.15

Carpet Stretchers—

See Stretchers, Carpet.

Gates, Molasses and Oil—

Gauges—
Marking, Mortise, etc. 55¢ 10¢ 55¢ 10¢ 10¢
Barrett's Comb. Roller Gauge 55¢ 10¢ 55¢ 10¢ 10¢
Stanley R. & L. Co.'s Butt & Babbet Gauge 55¢ 10¢ 55¢ 10¢ 10¢
Wire, Brown & Sharpe's 55¢ 10¢ 55¢ 10¢ 10¢
Wire, Morse's 55¢ 10¢ 55¢ 10¢ 10¢
Wire P. S. & W. Co. 55¢ 10¢ 55¢ 10¢ 10¢

Gimlets—
Nail, Metal, Assorted, gro. \$1.40 @ 1.75
Spike, Metal, Assorted, gro. \$3.00 @ 3.50
Nail, Wood Handled, Assorted, gro. \$4.00 @ 4.25
Spike, Wood Handled, Assorted, gro. \$5.00 @ 5.25

Glass, American Window
Jobbers' List, Jan. 21, 1901.

Less than Carloads 80¢ 50¢
Carloads 85¢ 50¢
3000 Boxes 87¢

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush. 37¢ 50¢
List B, Cans (1/4 pts., pts., qts.) 35¢ 50¢
List C, Cans (1/2 gal., gal.) 35¢ 50¢
International Glue Co. (Martin) 40¢ 10¢ 35¢

Glue Pots—See Pots, Glue.**Grease, Axle—**

Common Grease, gro. \$5.00 @ 5.00
Dixon's Everlasting, 10-lb. pails, ea. 85¢
Dixon's Everlasting, in bxs., 5 doz. 1 lb. \$1.20; 2 lb. \$2.00

Snow Flake:
1 qt. cans, per doz. \$2.00; 2 qt., \$3.20; 1 gal. cans, per doz. \$6.00; 5 gal. 1 lb. \$1.00; 2 gal. \$2.00

Grindstones—
Dicycle Grindstones, each \$2.50 @ 3.00
Pike Mfg. Co.
Improved Family Grindstones, per inch, per doz. \$2.00 (30¢ 4¢)
Pike Mower: Knife and Tool Grinders, each \$6.00

Velox Ball Bearing, mounted, Angle Iron Frames each, \$3.25

Guards, Snow—

Cleveland Wire Spring Co.:
Galv. Steel 7' 1000 \$9.00
Copper 7' 1000 \$18.00

Gun Powder—See Powder.**Hack Saws—See Saws.****Hafts, Axi—**

Peg Patent, Leather Top \$1.90 @ 5.25
Peg Patent, Plain Top \$3.50 @ 5.75
Sewing, Brass Ferrule \$1.50 @ 1.60
Saddlers', Brass Ferrule \$1.35 @ 1.45
Peg, Common \$1.25 @ 1.35
Brad, Common \$1.50 @ 1.75

Halters and Ties—

Covert Mfg. Co.:
Web 45¢ 2¢
Jute Rope 45¢ 2¢
Sisal Rope 30¢ 2¢

Covert's Saddlery Works:

Web and Leather Halters 70¢
Jute and Manila Rope Halters 70¢
Sisal Rope Halters 60¢ 20¢
Jute, Manila and Cotton Rope Ties, 70¢
Sisal Rope Ties 60¢ 20¢

Hammers—

Handled Hammers—
Heller's Machinists' 50¢ 50¢ 5¢
Heller's Farriers' 50¢ 50¢ 5¢
Magnetic Tack, Nos. 1, 2, 3, \$1.25, \$1.50, \$1.75

Peck, Stow & Wilcox 50¢ 10¢
Fayette B. Plumb:
Plumb, A. E. Nail 40¢ 10¢ 7¢
Engineers' and B. S. Hand 40¢ 10¢ 2¢
Machinists' Hammers 60¢
Riveting and Tappers 40¢ 10¢ 7¢
Sargent's C. B. New List 45¢ 10¢

Heavy Hammers and Sledges

3 lb. and under 1 lb. 5¢
5 to 10 lb. 1 lb. 5¢
Over 10 lb. 1 lb. 5¢
Wilkinson's Smiths' 75¢ 10¢ 10¢

Handcuffs and Leg Irons

See Police Goods.

Handles—

Agricultural Tool Handles—
Axe, Pick, etc. 60¢ 60¢ 10¢
Hoe, Rake, etc. 60¢ 60¢ 10¢
Shovel, etc., Wood Handle, 50¢ 50¢ 5¢

Cross-Cut Saw Handles—

Atkins' 40¢ 5¢
Champion 40¢ 5¢ 10¢
Dixon's 50¢
Stanley's 40¢ 10¢ 7¢

Mechanics' Tool Handles—

Auger, assorted, gro. \$3.30 @ \$2.50
Brad Axl \$2.00 @ \$1.50
Chisel Handles:

Apple Tanged Firmer, gro. ass'd, \$3.25 @ \$3.55; large, \$2.50 @ \$2.80.
Hickory Tanged Firmer, gro. ass'd, \$1.75 @ \$2.00; large, \$3.50 @ \$3.70.
Apple Socket Firmer, gro. ass'd, \$1.70 @ \$1.85; large, \$2.00 @ \$2.25.
Hickory Socket Firmer, gro. ass'd, \$1.80 @ \$1.75; large, \$1.75 @ \$2.00.
Hickory Socket Framing, gro. ass'd, \$3.50 @ \$3.75; large, \$2.50 @ \$2.85.
File, assorted, gro. \$1.00 @ \$1.15.
Hammer, Hatchet, Axe, etc., 60¢.
Hand Saw, Varnished, doz. 70¢ 75¢.
Not Varnished, 55¢ 80¢

Plane Handles:

Jack, doz. 55¢; Jack Bolted, 55¢ 60¢
Fore, doz. 35¢ 33¢; Fore, Bolted, 70¢ 75¢

Hangers—

Barn Door, New Pattern, Round Groove, Regular:
Inch 3 4 5 6 8
Doz. \$0.85 1.20 1.60 1.95 2.45

Barn Door, New England Pattern, Check Back, Round Groove, Regular:

Inch 3 4 5 6
Doz. \$1.45 1.90 2.55 3.10

Chicago Spring Butt Co.:

Friction 25¢
Ocellating 25¢
Big Twin 35¢
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50¢
Elevator 40¢
Railroad 55¢
Cronk Hanger Co.:
Loose Axl 60¢
Roller Bearing 60¢ 10¢

Lane Bros.:

Parlor Ball Bearing \$4.00
Parlor Standard \$3.25
Parlor New Model \$3.75
Parlor New Champion \$3.25
Barn Door, Standard 60¢ 10¢
Covered 50¢ 10¢ 10¢ 5¢
Special 60¢ 10¢

Lawrence Bros.:

Advance 60¢
Cleveland 60¢
Crown 60¢
New York 60¢
Peerless 60¢ 10¢
Sterling 60¢

McKinney Mfg. Co.:

No. 1 Special, \$15 60¢ 10¢
No. 2 Standard 60¢ 10¢
Stowell Mfg. and Foundry Co.:
Acme Parlor Ball Bearing 40¢
Atlas 50¢ 10¢
Badger Barn Door 50¢
Baggage Car Door 50¢
Climax Anti-Friction 50¢
Elevator 40¢
Express 50¢
Interstate 50¢ 10¢
Lundy Parlor Door 50¢
Matchless 50¢ 10¢
Nansen 50¢ 10¢
Stowell Parlor Door 50¢
Railroad 50¢
Street Car Door 50¢
Steel, Nos. 300, 404, 500 40¢ 15¢
Wild West 5¢
Zenith for Wood Track 50¢
Taylor & Boggs Foundry Co.:
Kiddler's 50¢ 15¢ 10¢ 5¢
Van Wagoner & Williams Hdw. Co.:
American Trackless 33¢ 4¢ 10¢
Wilcox Mfg. Co.:
Bike Roller Bearing 60¢ 10¢
C. J. Roller Bearing 60¢ 10¢
Cycle Ball Bearing 50¢
Dwarf Ball Bearing 40¢
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O. E. Roller Bearing 60¢ 10¢ 5¢
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Richards' Wood Track 60¢
Sponser Roller Bearing 60¢ 10¢
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Underwriters' Roller 40¢
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Wilcox Barn Trolley No. 123 40¢
Wilcox Fire Trolley, Roller Bearing 30¢
Wilcox Le Roy Noiseless Ball Bearing 40¢
Wilcox New Century 60¢ 10¢
Wilcox Trolley Ball Bearing 40¢

Stowell Mfg. and Foundry Co.:

Acme Parlor Ball Bearing 40¢
Atlas 50¢ 10¢
Badger Barn Door 50¢
Baggage Car Door 50¢
Climax Anti-Friction 50¢
Elevator 40¢
Express 50¢
Interstate 50¢ 10¢
Lundy Parlor Door 50¢
Matchless 50¢ 10¢
Nansen 50¢ 10¢
Stowell Parlor Door 50¢
Railroad 50¢
Street Car Door 50¢
Steel, Nos. 300, 404, 500 40¢ 15¢
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